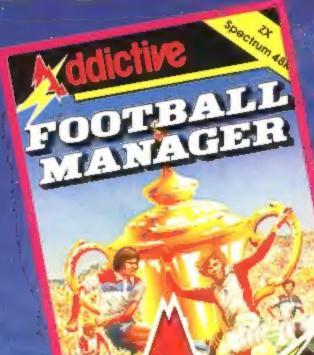


Specifium 401 104



Football Manager

Designed by Kevin Toms

This outstanding game of skill and strategy is now widely available and you can join the many thousands of satisfied customers who have purchased the game. This is no five minute wonder you will be playing this game for hours over many weeks (we know – our customers tell us!).



Kevin Ioms

Some of the features of the game:-

- ★ Matches in 3D graphics ★ Transfer market
 ★ Promotion and relegation ★ F.A. Cup matches
 ★ Injury problems ★ Full league tables
- ★ Four Divisions ★ Pick your own team for each match
 - * As many seasons as you like
 - Managerial rating
 - ★ 7 skill levels
 - Save game facility

ZX81 Chart Hame Computing Weekly 16.8.63



Comments about the game from press and our customers

"FOOTBALL MANAGER is the best game I have yet seen on the Spectrum and my personal favourite of all the games on any micro... To the ordinary person it is an excellent view of what can be done in the field of computer games... The crowning glory of this game is the short set pieces of match highlights which show little stick men running around a pitch, shooting, defending and scoring... It is a compulsive game but people who cannot take game sessions of 9 hours or so, which happened on one happy Sunday, will be grateful to know that there is a save to tape option. FOOTBALL.

MANAGER has everything it could ... The FOOTBALL MANAGER is the best game !

originator Addictive Games, certainly deserve the name Rating, 19-20 (Practical Computing - August 1983).

When I first received this game I spent the best part of the weekend playing it. Since then I have returned to it more often than any other the buly addictive quality of this game is the remarkable way if mirrors the real football manager's problems.

(Personal Computer Games – Summer 1983) 1983)

"It's my own fault you did warn me — I am totally and completely hooked on FOOTBALL MANAGER" (Mr. A. Wright — Lancashire.)

"it is by far the best software game that I have seen for the Spectrum." (Mr. N. Lincoln – Surrey.)

"I congratulate you for a morvellous game which keeps the player enthrailed." (Mr. N. Creasey – Gerrard's Cross.)

"I am writing to say what a great game it is, I have spent over 45 hours on it." (Mr, D. Feam – Gloucestershire.)

"Your FOOTBALL MANAGER game is terrific." (Mr. N. Cumming – West Bromwich.)







Action from the Spectrum version

Available from computer software stockists nationwide, including 🐲 & WHSMITH 🖚



Prices:

Spectrum 48K £6.95

\$5.95 ZX81 16K (N.B. 3D GRAPHICS ARE NOT INCLUDED IN

THE ZX81 VERSION)

To order by mail (p&p free) send cheques or postal orders to:

Addictive Games Albert House, Albert Road, Boumemouth 8H1 18Z

Dealers I For urgent stocks send your headed notepaper direct to our address.

"THE FASTEST REPLY I'VE EVER HAD"

(R. L. DAWKES, NEW ZEALAND)

SOFTWARE SUPERMARKET

At Software Supermarket, we play all the programs we can find for the Spectrum (and the BBC micro) and put just the best of each type into our ads and catalogues. We don't have the biggest list of Spectrum programs, just the best - from many different program companies, large and small, famous and just-about-to-be-famous. We produce no programs ourselves, so our choice is completely impartial

We quote reviews from all the magazines to help you decide and, of course, we tell you if your joystick will work! We choose the best - which saves you money. And we send them fast - which saves you time hunting round the shops. From over 40 countries you write praising our same-day despatch. But mail order or

phone credit card orders only please

You can now phone VISA or ACCESS credit card orders to us at any time, from anywhere in the world. (ACCESS includes Eurocard and MasterCard.)

ANY SPECTRUM

This program has everything—superb presentation, graphics and sound. Highly recommended (HomeCompWkly) A full arcade-action 5 screens in the best-ever Spectrum 'Phoenix' 5 skill levels. Choice of character sets, Demo mode. Cranis 48K quality into 16K. KEMPSTON, AGF Joysticks. (Megadodo) £5.50.

"Fun. hin, tun to play!" Live
stars' (HomeCompWidy) Run your
own Railway! Change the points to avoid crashes, watch out for by jackings by trate
passengers. Full screen graphics. 30 command keys, two track layouts. 7 skill levels, 14
sub-levels! Demo mode and Pause while you strike. Very catching bobby! (Microsphere) £5.95.

A superb game excellent playability (HomeComptVkty) Escape down the pygmy death-run. Smashing full-screen azumated graphics as you leap crashing waterfalls, swing across deep pits, dodge spiders and possoned blow darts. Separate 16K and 48K versions on one tape. Uhusual, exciting. (A&F) to 90

An excellent set of programs simple to use of great value to program of this could be the present they play with longer 1 (HomeCompWkly) TEN PROGRAMS for young children on 3 cassettes. All with great arcade-style graphics, 3 shape sorting games, 4 counting games, 3 adding and subtracting games. Kids 3-6, we recken. This could be the present they play with longest A3 ten programs, just £15.75.

3D SPACE WARS Brilliam 3D Space Battle that's brand new Demo mode. Good, clear screen tisplay of your instruments cockpit view files 2/3rds of the screen long-range scanner is actually legible! Refueling in space is great—just like the RAF, takes real skull. KEMPSTON, AGP Joysticks O.K. (Hewson) £5.95.

48K SPECTRUM ONLY

Find the Hidden Star and win a trip to Hollywood! A mad adventure with lots of good tunes and some very good cartson-type arumation. Follow Groucho and the Piman around the U.S.A. Discover the 22 closs and name the Hidden Star and you win the trip! (Entries case 1/6/84.) A brilliant follow-up to Pimania, using every bit of the 48K. FREE thit single on flip side may contain closs tool No joysticks. (Automata), £10

At LAST! No expert programming knowledge is needed to create your own SPRITE BASED MACHINE-CODE ARCADE GAMES with this tape by John Tunegate Holls: EIGHT EXAMPLE GAMES included in the tape—four written by complete amaterias! Clear 20-page manual. Design your own aliens, backgrounds, sound effects, artack waves, quickly and easily and then save the games you have created! Joystick oppositor your games, too (Charksilva) £14.95

Cartainly the best arcade game around for the Spectrum." (PopCompWkly) "Will probably be voted the No I Spectrum game this year." (HomeCompWkly) Based on the USA arcade charttopper. Miner 2049er. Superb graphics and sound as you search through 20 screens - each one a different arcade game. 20 screen demo mode. KEMPSTON joysticks. (Bug-Byte) E5.95.

HALLS OF THE THINGS. For me this is THE game of '83 hours and hours of sheet pleasure." (ZX Comp.) "Uses 99% of the available RAM" one of the best games we've seen for a long time." (Which Micro?) Explore an 8-storey maze, bind treasures avoid nasties. BUT this time you can see exactly where you are and what you'te doing as the maze scrolls as fast as you can move. Brilliant graphics (try waving your sword about!) and 19 command keys. (Crystal) E7 50.

A new full-screen graphic battle game: NOT an arcade game. You fight out a struggle for a river crossing during the American Civil War. 1 or 2 players. Choose your side, equip your army and fight the battle, great battlefield display. Fight to the death or within time limits as you wish New, different, intriguing. No joysticks. (Lothlorien) £5.50.

Superior to any other adventure game available
(Yf Comp) Takes first place—for quality and value for
money—(S-User) The adventure that made 1983 famous! Pres 285-page dilustrated book with
clues to this unique real-time adventure 80 locations 30 beautiful full-screen pictures
500-word vocab—16-page manual 40K of program took 4 people 18 months to write! No
joysticks (Mebourne) £14-95

GO TO JAIL Excellent graphics are used to make a very impressive display indeed highly recommended "(ZX Comp) The best computer version of the famous game we've ever seen. From 2 to 5 players (including the Spectrum at last) It's ruthless, but wonest.) Every original feature is faithfully reproduced and the screen display is miraculous. No yoysticks. (Automata) £6.00.

The mightiest Spectrum Kong of all' Full 4-screen machine-code program - just like the arcades. Jump the rolling barrels, and the fireballs. Avoid the flying duritb-bells: catch a moving lift. Smash things with your hammer to score more Demo mode training mode for each screen: bonus objects: Hall of Fame and a pretty gift shouting "HELP" KEMPSTON, QUICKSHOT, PROTEK Joysticks. (Ocean) £5.90.

CALL 01-789 8546 (24 hours) CHARGE PROGRAMS TO VISA OR ACESS

nd quote this : f own a 16K/4	want to cut this magazine, write your cider out carefumber 18 Spectrum, (Delete one) Lenclose a cheque/PO mac market OR Charge my VISA/ACCESS/EUROCARD/N	le pavable to
ignature lease write cle lame .ddtess	arly if we can't read it, you won't get it	
hone, if any, ii	Postcode n case of query	
	Program Name	Price
		1
		£
		1
		ĭ
		£
		£
POSTAGE	L. K. Add 25p yruy per order	£0.55p
AND	EUROPE Add 35p for each program	1
PACKING	OUTSIDE EUPOPE Add £1 for each - program avrilad	ť.
	OUTSIDE EUROPE ADD (1 TO TOTAL TOTAL	2

7/3/3/GO[[V

ZX Computing Volume One Number Ten Dec/Jan 1984 Editor: Roger Munford
Advertising Manager: Barry Bingham
Managing Editor: Ron Harris
Chief Executive: T J Connell

Origination and design by MM Design & Print, 145 Charing Cross Road, London WC2H OEE.

Published by Argus Specialist Publications Ltd, 145 Charing Cross Road, London WC2H OEE.

CONTENTS

Letters 8

A collection of your letters, with your ideas on the world of computing in general, useful routines which may be of interest and many other computing gems. A pleasure to read!

Nuclear Attack . . . 13

Nothing like the real thing, thank goodness — but a great simulation of the famous arcade game which will have you twitching at the keyboard. A game for your Spectrum from Matthew Homer.

Seriously now . . . 20

Peter Shaw busies himself looking through a number of 'serious' software packages for your ZX Spectrum.

Club Corner24

If you want to know more about computing, why not join the club!

Smaug's Lair 26

The dragon's out to get you — unless, of course, you manage to get it first! A 'cannon and ball' program for your ZX81 from Norman Brooks.

The Soft Touch . . . 30

James Walsh, surrounding himself with the latest Spectrum software, emerges triumphant to give us reviews of his favourite packages.

Block Deletion ...34

A useful utility for the Spectrum, courtesy of Rodney Francis,

Minefield 39

Watch your step with this listing for your ZX81 — you may never get out alive. Written by Stan Hatton, this certainly is an explosive program.

Competition 42

Enter this great competition and you stand to win a very special T-shirt as well as a complete new range of software packages.

The 1K Corral50

A wealth of 1K programs for your ZX81, varying from a currency conversion listing to a variety of great games. A must for all '81 users.

Structured Programming ...54

Tim Hartnell takes the difficult subject of 'structured programming' and puts it in perspective — it's easy when you know how...

Burglars 59

Steal yourself away for a couple of hours and type in this program for your expanded ZX81, courtesy of Andrew Brydon.

Sales Report 62

If you're running a busy sales office, this might be just the programming aid you're looking for. A useful business listing written for us by David Rands.

The ZX81 Soft Selection65

Sifting through the software packages for the ZX81, Nick Pearce comes up with a super selection for your delectation.

News70

All the news and latest gossip concerned with the world of Sinclair Research along with the up-to-date news of the software market.

Naval Manoeuvres 75

Mr Downie has come up with an adaptation of the popular 'Battleships' game for you to type in on your ZX81. Ships ahoy!

On The Side 79

No, this isn't about CB radio — it's a useful little utility, written by James Southgate, which allows you to print up long messages on your Spectrum printer...sideways!!!

|Educating, Peter? 80

What with the flourishing educational software market, Peter Shaw decided he'd delve into a few software packages and see what the standard was like. Find out what he thought inside...

Off The Wall 82

Mr Elliston has written us a smashing program which involves you building a number of walls — sound's easy doesn't it...just you wait!

Hell's Angels 86

A game in the 'space invaders' genre from Akram Malik. It's just you on your own in another one of those 'save the world' situations — so, do try not to let the side down.

Wild West 90

Saddle up your Spectrum and type in this listing for an enjoyable 'shoot em up' extravaganza, set in the old wild West, courtesy of R Page.

MPUFING.

ZX Computing is published bi-monthly on the fourth Friday of the month. Distributed by: Argus Press Sales & Distribution Ltd, 12-18 Paul Street, London EC2A 4JS, 01-247 8233, Printed by: Henry Garnett Ltd, Rotherham.

The contents of this publication including all articles, designs, plans, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Ltd. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Ltd. Any reproduction requires the prior written consent of Argus Specialist Publications Ltd. © Argus Specialist Publications Ltd 1983

Holmes Investigates 94

Paul Holmes scrutinises a selection of software packages, including some with a definite musical flavour.

Window Shopping 99

A feature article containing a brief look at the wealth of hardware produced by independant companies which can be hooked up to your ZX81 or ZX Spectrum. So, if you're thinking of treating yourself for Christmas, or even if you just want to dream about your ideal computer system, have a look inside.

Time Bomb 112

An explosion of a program for the ZX81 where time is of the essence. A listing written for us by Oliver Fritsch.

Jackpot 114

For ZX80 fans, Adrian Marsh has come up with a program to simulate a fruit machine.

Horse Race 118

If you fancy a day at the races, why not type this program in instead? Written by NC Pearson, this program has been designed for the ZX Spectrum.

Mastering Machine Code On Your Spectrum 12

After setting the scene for this program in the Aug/Sept Issue, Toni Baker finishes off the machine code needed to complete her 'car race' game. Have fun!

Bookshelf 125

Hot off the presses, Patrick Cain gives us his thoughts on the latest titles for the Sinclair user. Read it here first . . .

Five Card Trick . . 128

Kenneth Law has written a games program which simulates the card game, Pontoon. So, if you've got a ZX81, why not have a try for that elusive five card trick?

Skittles 132

For bowling enthusiasts, we have a simple to play, but nevertheless exciting, game for you, written for us by Andrew Cook.

Problem Page . . . 136

If you've got a programming problem, why not write to Peter Shaw, our resident computing expert? Peter answers some of your problems this issue.

Christmas Card . . 140

Clyde Bish will be sending his Christmas cards on cassette this year. If you want to find out about them, turn to page 140 at once.

Slate 144

A great adaptation of the popular puzzle, this ZX80 program was written by David Bellchambers.

Maths Maze 147

An educational game which allows you to improve your maths and have some fun at the same time. Get lost in maths with Nick Broom.

Best Three In '83 . 151

Nick Pearce and James Walsh team up to produce a feature which looks back over 1983 and the best software produced for the ZX81 and Spectrum.

Coding Graphics . 158

With a sprinkling of machine code, increase your character size with this useful ZX81 utility, courtesy of P Greenwood.

Reader's Reviews163

What do you think of the software produced for the Sinclair range of micros. Read what some of our readers think...and if you don't agree, write in and tell us!

Worms 167

Wriggle out of this game if you can! Gary Nugent has spared little machine code to make this a fine program for your ZX81.

Spectrum Software Checklist171

If you're looking around for that odd elusive software title, or you're simply browsing with a view to expanding your software library for Christmas, you're sure to find it here in our comprehensive software checklist.

Run, Rabbit, Run . 180

Mr McQuaker has you as a rabbit being chased around a maze by a dog — you'd better hurry though, otherwise it'll be rabbit stew tonight!

Missile Attack . . . 184

All you have to do in this program for your Spectrum is to save the HQ from approaching missiles. Unfortunately, Wolfgang Huebl has only allowed you control of one laser cannon — so you'll need to get your eye in quickly if you want to survive.

Machine Specifications ... 187

A reference guide to the Sinclair range of computers, it's all here.

ZX Computing is constantly on the look-out for well-written articles and programs. If you think that your afforts meet our standards, please feel free to submit your work to us for consideration.

All submitted meterial should be typed if possible; handwritten work will be considered, but please use your neetest handwriting. Any programs submitted should be listed, a cassette of your program alone will not be considered. All programs must come complete with a full explanation of the operation and, where relevant, the structure; Spectrum programs should be accompanied with a cassette of the program (which will be returned) as well as the listing.

All submissions will be acknowledged and any published work will be paid for at competitive rates. All work for consideration should be sent to the Editor at our Charing Cross Road address.

COMPUTER STANDS



POWER BASE

ZX81 ref. PBZX81 £13.00 plus 95p P+P PBS2 £19.00 plus 95p P+P Spectrum ref. PBS1 £13.50

Raised stand for ZX81 and Spectrum. Fitted LOAD/SAVE switch, and power ON/OFF for screen clearing. Saves wear and tear on connections. Front lip holds computer in place. No soldering, comes complete with all necessary plugs and cables.

NEW Spectrum Sound, with built in variable sound amplifier. (PBS2).

STACKPACKS



STACKPACK FIVE - ZX81 version including sockets, mains switch, neon cable and plug. Ref. BPS C19.35 + C1.50 P + P

STACKPACK SIX - ZX81 version excluding sockets etc. Ref. BP6 £12.05 + 80p P + P

MICROCARE STACKPACKS have

been designed to be used independently or in conjunction with 'Interface 1'. The STACKPACK has a neat housing for the Sinclair Transformer and has room enough for cable stowage. All STACKPACKS have SAVE/LOAD and ON OFF switches to simplify these tasks and save needless wear and tear on plugs and sockets.

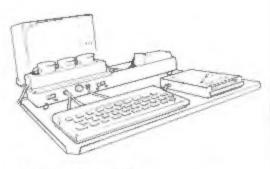
STACKPACK ONE - The complete BACKPACK for the Spectrum -SAVE/LOAD, ON OFF, FULLY VARIABLE SOUND AMPLIFICATION - THREE BUILT IN DAMP SOCKETS WITH MAINS SWITCH AND NEON INDICATOR, PLUS MAINS CABLE AND PLUG. Ref BP1 £26.00 + £1.50 P + P

STACKPACK TWO - All the features of BACKPACK ONE but without sockets, cable and plug. The top is suitable for carrying your own 'DURAPLUG' type 4 way 13amp connector. Ref BP2 C18.50 + 00.12

STACKPACK THREE - Includes 3 x 13AMP sockets, mains switch, neon indicator, cable and plug but does not include sound amp. Ref. BP3 £20.00 + £1.50 P + P

STACKPACK FOUR - No extras. just SAVE/LOAD and ON/OFF switches Ref. BP4 £12.04 + £1.00

MICROSTATION



The MICROCARE MICROSTATION is a compact workstation designed to accommodate a ZX81 or Spectrum. Cassette Recorder, Printer, Microdrive with room behind for the BACKPACK of your choice. It is ideal for use in restricted spaces and allows the computer and its peripherals to be moved around with a minimum of effort. Ref. MS £5.00 + £1.50

WOBBLE STOPPERS

At last, a fool proof method of avoiding ZX81 whiteouts caused by Ram-Pack wobble. Simply turn the plastic thumbscrew until the Ram-Pack is held firmly against the ZX81. No soldering no stick-on pieces, just common sense! Flat or tilted models.



for ZX81 and Ram-Pack and Printer ref. LW £5.75 flat LTW £6.75 tilted

plus 60p P+P Small tilted for ZX81 and Ram-Pack ref. STW

£6.25 plus 60p P+



£5.25 plus 60p P+P

WEARSAVER

This compact unit (4" x 3" x 14") has a SAVE/LOAD switch and a 9 volt ON/OFF switch for screen

clearing. Simply plug in your EAR and MIC plugs and your power

SPECTRUM Ref WSS c9.00 + 95p ZX81 Ref ZXS £8.80 + 95p

CHISTON CHAINS

NEW LOW PRICE PRICE Series B ONLY £20.50!

Spectrum 16K-48K

With our ME48 memory expansion add-ons your Spectrum can increase its capacity by up to three times.

- no soldering
- easy to fit
- simple to plug in
- fully guaranteed
- no loss of memory through wobble or white out.

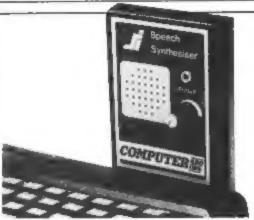
NB. Before ordering your Spectrum add-on please check which Spectrum you have in your possession. At the back of the ZX Spectrum the metallic contact strips can be clearly viewed. In the series A the space separating the strips is the same width as the strips. In the series B the strips are twice as wide as the space between.

SPECTRUM

ME16-48 Series A £34.50 plus 60p P+P Series B £20.50 plus 60p P+P ME16-80 Series B £46.00 plus 60p P+P

ZX81 ME1-64 £44.25 plus 60p P+P

FITTING/TESTING SERVICE. While you wait, personal callers Monday – Friday 9.30-5.00, £3.00. By return of post £7.00.



FANTASTIC ZX81 & SPECTRUM SS1 SPEECH SYNTHESISER SIZE 31/2" x 53/4" x 1"

- Making amazing speech effects with your ZX Spectrum.
- Specially designed for use with your Spectrum, just plugs in, no dismantling or soldering.
- No power pack, leads, batteries or other extras.

TAPE LOAD ANXIETY?

Vu load takes the frustration out of loading your ZX81 or Spectrum programmes.

- helps to ensure programme load every time
- · monitors tape output level
- gives positive save indication
- detects blank tape without disconnecting cassette wires
- · ready to use no wiring

TL £19,99 plus 60p P + P

- Ample volume from built in loudspeaker, Manual Volume Control on panel. Can be plugged in to existing hi-fi system.
- · Uses no memory addresses.
- · Free Dictionary of Sounds.

SS1 SPEECH SYNTHESISER C19.00 plus 80p P - P





FABULOUS SINCLAIR ADD-ON OFFER FOR ZX81 OWNERS

These are the real thing. ZX81 memory extensions made for the USA and specifically screened to stop radio interference.

- no soldering
- easy to fit
- simply plug in
- no loss of memory through wobble or white out

Fully Guaranteed for 12 months

ME1 16 USA £15.99 plus 60p P+P



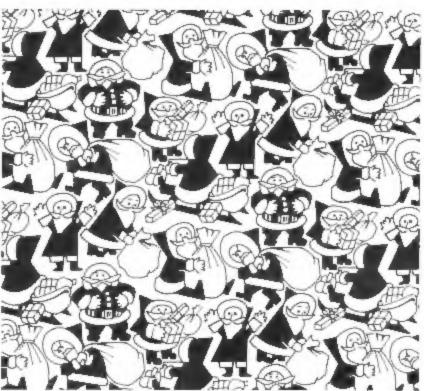
7-9 Thane Works, Thane Villas, London N.7, Tel: 01-609 7919

Trade enquiries welcome

ZX

Please send	ref
I enclose cheque/postal order for	made out to MicroCare, or I would like to pay by Access or Barclay Card
Name	
Address	
Occupation	Date

Welcome



Welcome to our Christmas edition of ZX Computing. And have we got an issue for you — as well as all the usual features and programs, there are some special features which you may find useful when doing your Christmas shopping for yourself. Go on, treat yourself — after all, Christmas comes but once a year.

And speaking of events that happen once a year, did any of you trek up to the Barbican to see the PCW show. Although not based solely on any one micro, there were many Sinclair-related stands in evidence. There were also some very important people wandering around amongst the visitors — one, Sir Clive Sinclair, caught my eye rushing from stand to stand looking at the new products on the stands.

The Sinclair Research stand was buzzing, especially as it was the launch day of their ZX Interface 2 unit as well as a dazzling array of new software for the ZX Spectrum. With a number of sample Spectrums loaded up and ready to play, there were a great number of prospective users trying their hand at the new games.

Other stands included Quicksilva, who were also basking in the glory of having released five new titles for the ZX Spectrum. Happiest of all seemed Mark Eyles, who's thankless (!) task was to demonstrate some of the new software. No, I'm joking really — he was having the time of his life, even if he wasn't that good at the games! But for more information on Quicksilva's new releases, have a look at the Software news pages.

Also at the show was Tim Hartnell fronting the Interface Publications stand. Bubbling over with his usual enthusiasm, Tim was very excited about three of his new publications in particular which deal with learning machine code on the Spectrum — maybe we'll have a chance to review them in a future Bookshelf.

Within these pages . . .

Just to give you a flavour of the contents of this issue, I'll try and whet your appetite. Perhaps this issue, there is a slight concentration on games programs, although there is the odd sprinkling of business and utility listings. As far as games go, there is a great game called Nuclear attack, Based on the arcade games of 'Missile Attack', this is a splendid adaption for the 48K Spectrum.

Complete with great explosions and missilies flying all over the screen, this program should keep you busy for hours and hours over the holidays. And speaking of such an ominous subject, have you seen the film 'War Games' which is currently on general release in your local cinemas? If you haven't, I can thoroughly recommend it as a very exciting film and one with a very thought-provoking ending. A film that will definitely make you think more about the games which are so popular on home computers!

There are, of course, a large number of great programs for you to type in in this issue, including a wide selection of 16/48K programs for your ZX Spectrum and 1/16K listings for your ZX81, I hope you enjoy them.

And the rest...

I have included a large number of reviews in this issue and have drawn upon the talents of all our regular reviewers for this task. James Walsh has been sifting through a wide selection of Spectrum soft-ware for The soft touch, and Nick Pearce has been equally busy with his ZX81 soft selection. And together, they have picked three software packages for the Spectrum and ZX81 which they think have been outstanding 'soft-ware successes' of 1983. You'll find their thoughts in an article called The best three of '83.

Peter Shaw has also been doing a little overtime on this issue so that in addition to his helpful hints in Problem page, he has looked at two areas of Spectrum software that we have not really touched on to closely in the past. The first, Educating, Peter?, despite the whimsical title, is a look at preschool software. And his other article, titled Seriously now. looks at a number of 'serious' software packages, I'd also like to welcome back Paul Holmes who has taken a look

at some software to help you choose some suitable gifts for the Christmas stocking.

Specially . . .

There are two special features this edition. The first, a continuation from the last issue, is a list of Spectrum software available on the market. The list is supported by an index of addresses of suppliers for all the titles featured in the checklists. If you can't manage to find a package there that will suit you for the Christmas holidays or a suitable present for a friend, then you're just not trying hard enough!

The other feature this issue is concerned with hardware add-ons for the ZX81 and ZX Spectrum. Providing a 'shop window', it will hopefully give you a rough idea of how you can improve your micro system without giving your wallet too much of a shock.

Contributions

We are always on the lookout for good programs and articles for future issues of ZX Computing, and where better to look than to our own readers. If, when reading through the magazine, you think you can write programs as well, or better than, our present contributors, then let's hear from you.

All contributions are, of course, paid for at very competitive rates. So if you've got you eye on a new ZX add-on or you'd just like to supplement your pocket money, get writing! It is vital, though, that all the programs you send us are totally original, and not 'borrowed' or 'adapted' from other magazines or books. (When Tim Hartnell was siting in the Editor's chair, he even received 'original' contributions he himself had written for his own books!)

Any kind of program (business, domestic, educational, or just fun) will be welcomed, but particularly those which use ZX BASIC in clever and efficient ways, or

those which employ certain routines which can be re-used

on other programs.

Program listings are vital, along with a clear explanation of how the program is constructed, what it does and what the user can expect to see once the program is RUN (a screen dump is particularly valuable in this respect). When submitting Spectrum programs, it is very important to remember to enclose a cassette of the program as well as the listing, as this will allow us to check the program before publication.

And so . . .

... this is Christmas, as the old (but gold) John Lennon classic went, I hope you all have a marvellous time over the holiday, but don't forget now - make more of your micro with ZX Computing. And if it doesn't seem to daunting - see you all in 1984. Roger Munford

Play your cards wrong?

Dear ZX Computing.

I typed in the program in the Aug/Sept issue of your magazine called Play your cards right. Great game, shame about line 970!

Unfortunately, it seems as if part of the line was obliterated and so becomes impossible to input into the computer. However, I managed to find the problem, which is nothing more than a missing division sign, and the line should read:

970 LET odds = INT ((v/((bet + buy)/(amt/5)))/

I hope this clears up any problems some of your readers might have been having with the program.

Sue Denham, London SW16.

Bug alert

Dear ZX Computing,

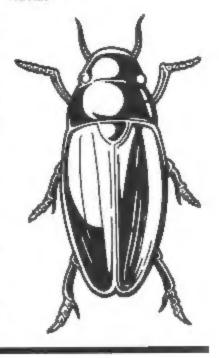
I have now been the proud owner of a ZX81 with 16K RAM for just over a month now, and two weeks ago I bought my first ever issue of ZX Computing - the Aug/ Sept issue, in fact.

Since then, I have had many fun-filled hours of shooting down enemy spy 'planes in...yes, you've guessed it . . . Stephen Smith's Reconnaissance alert. But I could not understand why I kept getting a great deal of enemy aircraft on the screen at once. You see, the enemy kept leaving shadows of themselves on the screen.

Eventually I managed to trace the error to line 415, in which the '10+B' should in actual fact be altered to read '10 + D'. This then gives one plane which rubs itself out as it moves, instead of leaving a trail of exact replicas behind!

I hope my small correction helps to make the enjoyment of a superb game even better.

Yours faithfully, Nell Wright, Notts.



The generation game

Dear ZX Computing.

I wonder if any of your readers are interested in a small pattern generator I wrote on my ZX81. The program shown in Fig. 1 produces random patterns, such as that shown in Fig. 2.

You can, however, modify the program to produce a more specific style of pattern, and this program is shown in Fig. 3. You can alter the type of pattern produced by varying

the values of A\$, Y or X. Also, if you want to make a copy of the patterns you make, you should add the following two lines to your program:

280 IF INKEY\$ = "" THEN **GOTO 280** 285 IF INKEY\$ = "Z" THEN COPY

Hope your readers have some fun with these listings. Yours faithfully,

BJ Funnell, Watford.

Fig. 2.

Fig. 3.		
10 20 50 50 100 110 120 130	REM "PATTERN" RAND LET R\$=""""""""""""""""""""""""""""""""""""	
150 170 180 200 200 210 220 220	PRINT RT 21,30;Y PRINT RT 0,0; LET U=INT (704/Y) LET U=704-(U*Y) FOR K=1 TO U PRINT C*; NEXT K PRINT C*(1 TO U)	

Fig. 1.

1	REM "PATTERN"
10	RAND
20	LET ASE" BENET
100	LET Y=5
	DIM CS(Y)
	FOR J=1 TO Y
130	LET X=INT (RND :4) +1
140	LET C\$ (J) = A\$ (X)
	NEXT J
7.0	PRINT AT 21,30;" "
	PRINT AT 21,30;Y
	PRINT RT 0,0;
300	LET U=INT (704/Y)
205	LET U=704-(U*Y)
210	
550	
260	
270	
290	GOTO 100



Getting in tune

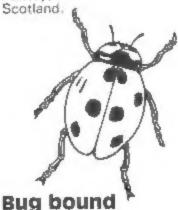
Dear ZX Computing,
Referring to your 'Guitar
chord' program in the
Aug/Sept issue of ZX Computing where you say 'now if
only someone could write a
program to tune the guitar'' —
look no further!

I have written a program, marketed by Lasersound Ltd, which use the Spectrum's sound and graphics to help you tune your guitar. In addition, 48 chords can be displayed in a similar way to the sample screen shown to illustrate the program in your magazine.

You can also access a table of tonic, sub-dominant, dominant and relative minors, and transpose a tune into the key of your choice. Finally, there are a selection of traditional folk songs for you to accompany.

My program works on both the 16K and 48K Spectrums (Spectra?) and is available for £6.00 from Lasersound Ltd, Stratford Workshops, Burford Road, London E15. Yours faithfully,

J Douglas Barr, Paisley,



Dear ZX Computing, I have just purchased a copy of the Aug/Sept edition of ZX Computing and, fame at last, I saw that you had published my 1K dice program as part of the 1K Corral.

However, there are mistakes in three lines as published — you have managed to miss out all the graphics. Also, there is a semi-colon missing from line 10.

Here below are the three relevant lines as they should have been published:

5 PRINT AT 9,T-PI:" "" (Graphic shifted 3, 3 × Graphic shifted 6 PRINT 6 9 + S.T-PI;" (Graphic shifted 8, 3 Graphic shifted spaces) 10 PRINT AT 11.T-1:" "" AND S-2 "INT (S/2); AT 10,T;"■" AND S I; AT 12,T-2;"■" AND S I; AT 10.T-2:" " AND S PI: AT 12.T;" " AND S PI; AT 11.T-2" AND S = 6 (this line includes Graphic shifted Os and one Graphic shifted space)

With the graphics in correctly, plus the semi-colon, the program should run perfectly. Your faithfully,

Colin James, Clwyd.



What a load of rubbish!

Dear ZX Computing, I am writing to tell you what I think is a bug in the ZX Spectrum. Try typing this in:

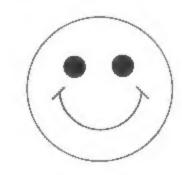
10 PRINT "(any amount of characters you like)" 20 GOTO 10

When asked 'scroll?' press Caps Shift and Symbol Shift together. The word 'RUN' appears. Now press Enter. The whole screen will fill with rubbish (pig-latin?).

If you follow the same procedure, the same thing happens each time — but if you press another key, the screen prints another half page and stops with 'error k invalid colour'. Also, whatever state the cursor was in will scroll up the screen (be it K, L, E, G or C). The screen will be full of blanks if you used a null string in the above program.

I would be very interested if any of your readers could offer any explanation for this mysterious occurance. Yours faithfully,

Raymond Clune, Essex,



Service with a smile

Dear ZX Computing, I recently bought a Hitachi 14 inch colour TV being already in posession of a 48K Sinclair Spectrum and was most surprised and dismayed to receive only black and white pictures.

The retailer, Landau Electronics of Sutton, was contacted. The young salesman walked me to their television shop several doors down the High Street, He then:

(a) Checked my Spectrum with a similiar T.V. In the shop.(b) Checked a new Spectrum

with the T.V. (In all cases no colour).
(c) Used a new mains adaptor.

He then walked all the way back to the shop and returned with four of five more Spectrums. He tested two or three more and surprise, we had colour. He exchanged my Spectrum and mains adaptor for the latter Spectrum and adaptor for me at no charge and as I walked out of the shop he made the parting remark that I should be OK now, but if not, to come back and he would test some more machines.

What after sales service! I had to bring it to your attention and hope that you can see fit to publish this letter. Yours faithfully,

LEJ Fraser, Surrey,

Serially . . .

Dear ZX Computing,
Here is a programming method
for putting a serial number to
one of a set of strings. This has
arisen in your letters in the
form of converting a string
C\$ = "2" or "3" or ... or "9"
or "T" or "J" or "Q" or "K"
or "A", representing a playing

card, to a number C from 2 to 14. Here is a test program to Illustrate an efficient method:

10 INPUT C\$
20 FOR C = 2 TO 14
30 IF C\$ <> "23456789TJ-QKA"(C-1) THEN NEXT C
40 PRINT C\$;" ";C

If C\$ does not represent a card, C takes the value 15. There is a certain resemblance to the solution of ADV Barnett (Aug/Sep 83), but this is shorter.

The technique has many applications. A more elaborate example derives M, the month in figures (1-12), from M\$, the name of the month, abbreviated, if desired, to its first three letters.

10 INPUT M\$
20 FOR M = 3 TO 36 STEP 3
30 IF M\$(TO 3) <>''JANFEB
MARAPRMAYJUNJULAUGSE
POCTNOVDEC''(M-2 TO M)
THEN NEXT M
40 LET M = M/3
50 PRINT M\$; "";M

A non-existent 'month' puts M = 13. Yours faithfully.

WE Thomson, Suffolk.



Strange...but useful

Dear ZX Computing, In response to Toby Philpott's letter in your June/July issue concerning the queer results on entering certain 'RAND USR' instructions on the 16K ZX81, I typed them in. Needless to say, the stated 'strange codes' occurred, but I couldn't help wondering as to what use these could be put so I set about finding some which would be more useful (say) to a machine code programmer.

Here are the routines with their decimal address and also their BASIC equivalent (if any):

3875 FAST 3086 SCROLL

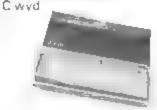
1476 Equivalent to 'EDIT' 930 Equivalent to 'BREAK'

*757 SAVE *833 LOAD

2955 Equivalent to ',' in 'PRINT'

A star by the number indicates. that the computer must be in FAST mode beforehand. The OAD instruction is the one I find most useful as it allows me to make back up copies of any of my friend's games so I could check out how they worked! Yours faithfully

Gary Threadgo d



Calculating confusion

Dear ZX Computing When the question of calculating memory addresses from binary is discussed most books suggest the use of a caculator or a computer to do the caculation, elmultiplying the msb most significant bit in binally by 256 inused to keep a scrap pad for the calculations but found it was too distracting particularly since one needs to concentrate on detail when assembling or disassem. ting machine code and distractions can be fatal to the program

tound it much more convenient to wite a 256 times table giving the mist values for one to 256 times 256. Since ti was essent a to get tinght I checked tion a 48K Spectrum with the following program

10 LET y = 256 20 FOR n 0 TO 255 PR NT n * y 30 NEXT 1

The program is easily converted for amost all other home computers Yours faithfully

JD Sparke Cleve and

Very interesting...

Dear ZX Computing One night when I was playing with my ZX81 d scovered something very interesting on my computer

had accidently pressed the B and Shift keys at the same time and the computer gave the report code D 25 II tried pressing the same keys again but with a different program but again, got a report. code saying I had pressed the Break key

So if you want to stop a program without pressing the

Break key try pressing the 'V B and Shift keys together Yours faithfully

Kenneth Meade Sunder and

Pen pal?

Dear ZX Computing Having just obtained my first copy of ZX Computing Tieved the Club corner rather lealous. y. What an abundance I m. not a member of any ZX clubs over here mainly because there arenit any

However I would very much like to correspond with some of your readers, to exchange programming typs news programs etc.

Loperate a ZX81 with 32K and ZX Printer Any interested parties please write Yours to thfully,

Tony LaRou 2345 Northfield Trenton, MI 48183 **JSA**



Ghost in the machine?

Dear ZX Computing While writing a machine code program for my ZX81 I noticed a bug in the part of the Interpreter concerning the function INKEY\$ NKEY\$ produces the character of the key presently being depressed. However, if more than one key is being depressed the interpreter gets confused and returns an empty string So, when I tried

10 IF NKEY\$ <> " THEN **GOTO 10** 20 RAND JSR 16514

The system crashed if more than one key was being depressed

Further investigations

revealed that the 2X81 retrieves information from the keyboard via two inetworks. shown n Figs 1 and 2. The Interpreter works by loading the result of its keyboard scan into bytes 16421 and 16422 the system variable LAST K f byte 16422 the high byte, s equal to 255 then all bits are on and no key is depressed. If not, then it looks up which bit in 16422 is off It then checks if a bit in the law byte sloff and decides which key s depressed since the result is unique to that particular key However if more than one key is depressed then the bit situation is mixed up and the method normally used does not work it is then moossible to tell which keys are depress. ed. The Interpreter gets past this sticky situation by return. ing an empty string

t is therefore, possible to tel whether the empty string represents no keys being pressed or more than one key being pressed by checking the

byte 16422 for 255, which means all bits are on and no key is being pressed. So the replacement for line 10 s

10 F PEEK 16422<>255 THEN GOTO 10

One other problem is that of the Shift key alone being pressed Normally this is impossible to detect ibut this can be solved using

10 IF PEEK 16422=254 THEN PRINT "SHIFT IS PRESSED ON IS OWN'

Note that a though it is impossible to distinguish keys if more than one key is depressed it is still possible to detect if a particular section is being pressed. This is put to good use in New Generation's 3D Defender game Yours faithfully,

WITH SHIFT

11011110

Alastair McKinstry County Dub in. reland

Fig. 1		
Section 1 2 3 4 5	High Byte (Peek 164 Keys 1 Q A O P New! 2,W,S,Z 9 O L 3 E D X 8 K M 4 R F C,7 L J,N 6 T,G,V 6,Y H B	ine and Space
RESULT		
No Key Section 1 Section 2 Section 3 Section 4	WITHOUT SHIFT 11111101 11111011 11110111 11110111	WITH SHIF 11111110 11111100 11111010 11110110 111101110

Fig 2

Section 5

Low Byte PEFK 16421

11011111

Section	Keys Z,X C,V
1	A S,D F G
2	QWERT
3	1 2 3 4 5
4	6,7,8,9,0
5	Y,U 1 O,P
6	H J,K L Newline
7	B,N,M ,Space

RESULT

	BINARY
No Key	1111111
Section 0	11111110
Section 1	11111101
Section 2	11111011
Section 3	11110111
Section 4	11101111
Section 5	11011111
Section 6	10111111
Section 7	01111111

ORDER FORM

For advertisement appearing on page number 40/49

SOFTWARE FOR SPECTRUM, BBC, ZX81, COMMODORE 64 AND VIC 201

TANK Spectrum 16K. Con Principly	MAZIACS Spectrum 40K. D. Printity.
May your Acress the Bridge. Was is a full fractive goods strips.	copies on the potential of the 40% (potential. "Fits game dust the control of the potential
CHNT18436 Speedrum 1644. Co. Housing to the part of the contract of the contra	GOLD MINE Spectment 14K.S. Goodedto
50%	TRAMIX SEC 32K. A. Pronoh
INETECHOIDS Spectrum 1614, Ben Princing	If you can which feet, set frotor and you're not delaw delined and an arrange grows expenence is for you.
IPAWN OF EVIL Spectrum 16K. Den Principle - Common 16K ben by Common 16K ben by Common the Common of	SPEED DUEL Spectrum 49K. K. Ledder Namy have bred, but man have halled to statute the Manth State 10 close game. This is the Winner.
officers are brazed to the commer, true you will also mind notice and shoulding to distribute the commerce and shoulding the distribute the commerce and should be an import in 10 mins CICACT BUY THIS SAME.	APPLE JAM Spectrum 40K. E. Historian The best cruinal dairy game of 1962 serving out ambutured framed in gready fetting and of course apple 2 junt Historian and Inggles out the
CUND FX Spectrum 48K. Den Priesting. Indias the beginner to product on infinite range of laund official light spectrum and spectrum would envy. No mathem code brownings motified.	BRADAMS DELY THE LAST MARKET
DESTRON Spectrum 16 or 40K. II. Sashwaad	A brand new fast game for the Tot 2000. How the divine wow to pass better year way iron the last. Watch sat for histories and stay on the good, he light his all for all the last like all the pass to divine an all the game to divine and the game to divine an all the game to divine and the game to divine an all the game to divine
ASTRON Spectrum 16 or 40%. M. Lovets &R. Bestierend	ZXED TOOLKIT 2X81. R. Santorund
ignifered assendier and south). Under for troperiors and depens alle. They our notifies and get a sape Fileds FIREIT About Middle Concession 1.6 — 4000, it. Bostowness	PARTEOR STORM ZXBT D. Heales
IND is a photonic natural for use on the 16K of 49K Spectrum, to the 14K Stept million	(Biograss from versum also available) 1944-4-Ch. Ch. A. DEFE 1941-9-55 Communication 4-5, 15 differentiality.
EXCLD (be-extent) Spectrum 16 — 40K. R. Gerbarded	WHO DARES WINS Commediate 64. K. Managhtlist
SPECTATOR BC 32K. A Franch Commodure 64A. A. Premilt	ALIEN RESCUE Commodate 64. K. Minagintin. Takin mendes to learn but a Mining to marker in a Imposition Resourcement. Judgment and skill are bested to expense.
Section 400. Dury Principles Supplement the party bland of physical pagement, forestalls, sheer sublisheness and high	PROTEANS FOC JUK. D. Heeking
is survive as Chesmir? Will you be able in disreption the injustation papalismen, may in a judger with the parameter socret public and minist the right disminus to hoop control of injust valuable suggeste? Care you previous, but vive or even differentially from abbusinesses. (I):	It aur further spiritors the former, angelest minit des
To you have the right bland of shreets parameter, incoming, draw communication in the parameter and high parameter as Common and high parameter as Common as the same and high parameter as the same as the same as the same parameter, and in the same as the same as the parameter and the same as t	SUBSCOLLER DEC 12K. C. Region
PRILET PLACHING Spectrum 48K. 6. Painter	GOLF Spectrum 164. D. Johnson
ingerly use of graphics and calour. Just the the real thing and just at Additional INCODINFORM WHACKER VIC 30. C. Dougles	EALACTIANS Spectrum 168C.O. Tutmer
PROME Construe LAK & Williams	ROAD TOAD Spectrum 14K
Buye's get basen by the bytos or makkind by the relation in your desperses blockinds. I will be related to the survey of the sur	Join Tandy an his healt journey as the Life Peals All-department of the STAR TREIX 3000 Spectment 40% All Plants Buildy go where everywels bean licture. Then go further
PERSONAL FINANCE Spectrum 48K. S. Mills	INVADERS Spectrum 16K. D. Heaths.
1003 A SPACE ODDITY Spectrum 40K. C. Payers 84.** In rangung graphs; selectures with a seriors as never as a security and a second sec	JAWZ Spectrum 16K
DOET Spectarum 40K. R. Pleming	INVLLIE-BLIG Commodore 64. K. Moughtiny
LICKER Ipoctrum T&K. A. Bigham	HARD CHEESE 14K Spectrum, P. Johnson & E. Patroll
Vic 20. G. Peineer	(juier and nerval approxiste: A nevel and writer full feature guide for fragishabil metricus. (iii Line CHINI AN Spectrum 14K. D. Brewester
IBC 32K, D. Regen	A referency fruity power pil postod popular program with 20 main (\$100) 20 the origin A strapty superis Specificate spicial.
Cody or a manch of Sangley's does a provide program to the commence of the Sangle and inflantly prignal on to more translation to find the summer was some find the Salter Debrokens Club by conquering sevel 8 before Hook.	AUMBLY Spectrum 40K.D. Priestiny
EASY 2X81. M. Wright & P. Arundoll	A brand new original all singing all senting supervisors commend management possible. A management of property to the senting supervisors for the senting supervisors of the senting supervisors. A management of the senting supervisors of the senting supervisors of the senting supervisors of the senting supervisors. A senting supervisor of the senting supervisors of th
PLIPER PREFES NOC 33K. D. Hashimi. No need to lose money on the real thing This is the real things	Property Page
	Charle completes wellenge.
ease send methic following games	Registrate BOOTS, W.A. SMITT, LABOUTS, SPECTRAL (1975) (Inc.)
	COL

Places send your completed order form to



MK Traviles Ltd., Unit 6, Shire Hill Industrial Estate Selfron Waldon, Bases CB11 3Ath Totaphares (9779) 26390 (24 hrs) 5 lines

NAME ADDRESS

POST CODE

Fenctose chequerPO for £ or charge my Access8arclaycard account number

Please add SOp to total order

Nuclear attack

Defend the cities from the enemy missiles in this fabulous Spectrum simulation from Mathew Homer of Port Headland, Australia.

In this program, you are in chaige of a nuclear missile site which has been constructed to defend six cities from sudden nuclear attack. And your job thankless as usual is to stave off the inissiles so that the cities can be evaluated.

There are sixic ties all to save and from your face are base you have 30 surface to air missies which you can launch at the on coming missies. However watch out for your base because if that gets hit you will ose all of your missies.

You fire a missie by maneavering an X around the screen and hithing the fire button A the keys required to move the X in any one of eight directions and fire your missiles are given as part of the instruction routine within the program.

Point to point

For each missine you shoot out of the sky you will receive 1,000 points, and if you

manage to save any of your cities after a barage of missiles you reneive bonus points. Once you surpass 50 000 and 100 000 points, you get a bonus city to save.

that every now and then an aerob the will move across the screen and drop a number of missles. However, the plane is considerably lower than the enemy missles usually start at soil is best to take out the plane just as soon as you can especially before it unloads its deadly cargo!

One other small tip but one im sure your soon get the hang of is that it sibest to aim your missiles a little before the enemy missiles so that they actually run into the explosion.

Okay hale some fun but remember anything has got to be more fun than the realthing!

Line by line

Here follows a breakdown of the program. Nuclear attack so that you should gain more of an height into its intricacies.

Lines 2 62 Lines 65 95

Lines 100 995

nit a sation of the score and variables. Determines the course and targetting of the new missions.

Scan the keyboard and determine the movement of the missiles

unes 1000 2060

Lines 2100 2209

Lines 2210 2438 Lines 2500 2760 Lines 3000 3170

Lines 4000 4130 Lines 5000 5200

⊾ nes 6000 6049

Lines 6050 6078 Lines 6080 6120

Lines 6130-6310

Lines 6330 6900

Lines 7000-7150 Lines 7200-7620

Lines 7985 8200

Line 9005

Control the movement of the sites and determine if the defence missiles are to be fired.

be fred
Decrease the rate of the parage against
the cities determine whether the attack
has finished or if all the cities have been

destroyed

Form the scoreboard routine

Form the bonus points routine

Control the bomber and and a seithe bomber aim sales

Contain all the user defined graphics. Form explosions on the screen when missies or bombers are hit by the defence similar less.

Control the firing of the defending missiles

Contain the instructions for the game. The initial display which you see when the program is first run.

Control the setting up of the screen and the setting up of the missite sites when stocks are not all used up.

Control the drawing of the missile storage on the bottom of the screen Control the explosions of the defence similar testing.

Form the nucleal explosions and the mushroom cloud

El minate the missile trais and or the cities locations insuring that any new missiles will not aim at locations of a ready destroyed cities these lines also calculate the loss of missiles if the defence site is hit.

The saving routine. To save the program on tape is mply type. GO TO 9005

Typing tips

The following hes are ones which can be efficult or replaced should you wish to type the program in stages. Obviously, REM statements can

peleft out but for you own plece of mind you may well be better off inserting a few here and there to give you in dealof how the program operates. Anyway here are the areas of the program you can modify

Lines 2210 2438

This routine forms the scoreboard but could a ways be replaced with a STOP statement. The scoreboard routine could also be used in other programs using SS as the score variable. The display when the program is first.

700

L nes 7268 7620

unes 6080 6120

The nuclear explosion and mushroom cloud. These lines may be replaced by the far less spectacular routine shown in Fig. 1.

TRES FLASH 1 PRINT RT 19.tt.

AT LO (1." TO 30 STEP 10 BEEP
.0S,W SEEP .0S 25-W NEXT W F
STO FLASH 0 PRINT AT 19 't
.AT LO.tt, HI 21 11

Fig 1

=5. LET SS=0 L PAPER 5. BORDER R 0 INVERSE 0. BORDER 5: BR 12 INK 0 xx =5 BR BEEP .5,30 OUER 0. CLS BEEP .5,30 3 DIM g(7) LET mm=7: LET g(3)-92 LET q(8 LET 9(2) =60: 9(4) =128: LET LET g (5) g (6) =196 · LET LET 9 (7) =228 =164

4 LET ab=28. LET ss=0. DIM c\$
(4,14). DIM c(3): LET c(1)=0. LE

r c(2)=0. LET c(3)=0. GO TO 6050
5 REM Variables. a,b,c,d,e,f,
j,h,i,j,k,l,m,n,o,p,q,r,s,t,u,w,
x,y,z
5 REM Variables: Z\$,aa,bb,cc,
dd,ee,ff,gg,hh,ii,,j,kk,ll,mm,nn

うちちょばばきもし、キェンチよういのうちゃくかかりメスとう 7 REH Variables ab,80,8d,8e, 37,35,31,37,3% 10 50 70 4000 11 OVER 0 IN OVER OF INK 7 P INVERSE O FLA CLS . GC TO 6000 11 PAPER W BOR FLASH 0 BRIGH DER 0 1 REII "Medicar Attect
Writte, Eviling
Mattrew Tae"
Name 尺巨岩 RES. REH 유로트 REIN IF SSYM THEN LET SSAM BEER .5,30 IF 28 23 30 DIM 2 (30) DIM m (30) DIM q 30) DIM 1 (11,2) DIM a (11) DI d (11) DIM 6 (11) DIM f (11) 34 LET ad=0. LET yy-b LET t b 1323 34 LET ad=0. LET yy-0 (ET t op LET rr=0 LET tk=0 LET tt=12 LET nn=0. LET oo=125. LET qq=14 35 LET aj=0 LET jj=6. LET ii-LET aa=1 LET cc=1 LET dd=0 LET ee=1 LET ff=1 LET gg=1 L T hh=1 LET bb=0 LET s-0 LET =0 LET p=0 37 PRINT OF LET P=0 LET P=0 PRINT AT 0,10." PRINT AT 0,10,"SC ET b = 0 URE ", SS 40 AANDOMIZE 500 43.99+1 f(b) -INT (B) d(b) -3((INT LET (F'IE +101-4 E 4121-4 另约23+600 + +1 1-175*() (b) /5) 75 LET e (b) -LET 2 (6 . 1) d (6) LET 1 (6 . 2) 42 IF IF E- 3 € dib' 0 05 dib 1255 THEN 90 71 IF 1 1 25 THEN RETURN 100 GUER 0 101 IF 1 0 OR MALO THEN GO TO E 166 IF AND 11 THEN 30 SUB 65 FOR 341 TO 5 110 115 DEAN 1 (9), -120 PLOT d(a),e.a) 130 LET etal = 614 5 LET dial -d 131 IF 38 1 THEN BO TO 1050 132 LET K-1 IF FOINT (816),618 1-11-1 AND ATTR (1175-6 81) 6,8 81/8 PP THEN GO TO 3600 135 IF IN 65278 253 DR IN 64510 IN 64510 *IN 65092+IN 57342+IN 49150.1020 THEN GO SUB 1000 140 150 990 0 IF RMD .. 9 THEM GO TO 3000 0 IF IN 65270 263 OR IN 64510 65022+IN 57342+IN 49150 1020 EN GO SUB 1000 2 IF 55-1 THEN RETURN +IN THEN 992 GO TO TOO 335 1200 1 E x = x + (IN 64510=251)
y = y - (IN 57342 < 255)
x = x - (IN 64510 - 253)</pre> LET 1010 1020 LET 1030 LET YESTHEN YESTHEN IFT. 1035 49150 (255) LET $M = Q_1$ 000 5030 5050 5000 9 0 THEN LET 9=0 9 20 THEN LET 9=20 x > 31 THEN LET 4=31 ĪF IF 2040 2045 IF C=X AND D=Y THEN GO TO 2 959

PRINT AT 4, %, "A"
INVERSE O PRINT
ERSE O OVER O PRINT AT OUER 1 2046 ED49 OVER 1 INVERSE 0 250 IF "X " THEN GO SUB RETURN 2060 GO TO 67 001ء 2190 mm . . . THEN GO TO 2210 2200 İF 2202 2209 2210 IF 99 (=ab 1 GO TO 2500 THEN GO 5,8," RT PRINT 2220 PRINT AT 6,8, 😘 7,8," 2230 PRINT AT 2242 PRINT AT 9,8,"-2250 PRINT RI 10,8," 2260 PRINT AT 11,8, STEP 1 BE NEXT & 2270 FOR a≈40 3 * .002,a BEEP . NEXT .0015,8 a 00 <u> 180</u> BORLER L HIR 7 PAPER FIGHT 1 O(ER 0 IV.LAGE 0 CLS

282 LET W 0

290 PRINT AT 0.11, RORESOARD"

2292 PRINT AT 3.0, SCORE

NAME" ' 1 ", TAS 14-LE

N STR\$ ((1), (11), (1), (1)

2993 PRINT AT 7.0, 2 ', TAS 14

-LEN STR\$ ((2), ((2), ', (3))

" TAS 14-LE 2293 PRINT AT 7,0, 2 (\$12)
-LEN STR\$ (12), ((2), (\$12)
3 ", TAB 14-LEN STR\$ ((3), (13)
2294 PLOT 7, 154 DRAW 240,0 DRAW
0,-64 DRAW -240,0 DRAW 0,64
PLOT 7,142 DRAW 240,0
2295 PLOT 32,154 DRAW 0,-64 PL
OT 127,154 DRAW 0,-64 PL
OT 127,154 DRAW 0,-64
2300 PRINT AT 12,6, YOUR SCORE.
",AT 12,16,".....',AT 12,126
-LEN STR\$ \$51,55
2305 IF W 0 THEN GO TO 2370
2310 FOR a=1 TO 3 IF \$5,(3) TH 2305 IF W'V TO 3 IF SSECTA ...
2010 FOR A=1 TO 3 IF SSECTA ...
EN GO TO 2016
2315 NEXT a GO TO 2370
2316 PRINT AT 16,2, 'You have the Number ',a," score. Number ',a," score." 2317 INPUT 'Please ENTER your me tup to 14(etters)....",c#14 2320 FOR w -2 TO a 57EP 1 2325 LET c#(w+1) =c#(w) 2330 LET c(w+1) =c#0 NEXT W +1) = C (W) 2332 LET 0 -2 LET 0 (a) -55 LET 0 \$ (a) -0 2335 2340 C\$(a) -C\$(4) T AT 18,2, 235Ø 2355 PRINT 2285 2360 TO 2370 PRINT AT 18,6, "C=Copy of sc prepagalq 2380 PRINT AT 18,4, Please make

a choice.... 2385 PRINT E End the Pr ngram 2390 PRINT " 5 Start anothe game . 400 LET asas-INNEYS IF as-"" 手用先 OR as- E' THEN OL a\$= '€' 2409 IF as e' LR as E THEN ST 5410 5p IF 2420 IF 43-TO 2422 1421 GO TO 2430 2422 LET XX=5 LET PP.42 INK 2422 LET XX=5 LET PP.42 INK PAPER 5 BORDER 5 BRIGHT 0 PAPER 5 BORDER 5 BRIGHT 0 CL5 IF OR as 'S' THEN $0 \odot$

P423 DIM 9(7) LET LET 0.00 = 7 8 LET 9 2, 50 LET 9 41 = 120 LET 9 (5) 1 - 190 LET 3 7 226 3 GUT TO 5050 9 (3) =92 9(1)=28 -164 LET 9.6) 196 424 LET absolute 2050 Cr :5 2430 IF 3.5 THEN GD TO 438 438 COPY BEEP .9 CO PRINT AT 15 2500 BORDER 0 PAPER 0 BRIG INN 4 INVERSE 0 FLACH 0 SRIGHT 0.05 CLS **0** 1501 1501 LET 4 & LET : SITY PIONIS. ILE POINTS. 1510 FRINT AT 0,10, 11, c, MIS But a FOINT 520 PRINT AT 3 5 CTRIES REMAIN NG PRINT AT A, T HOME FOR A.1). WE FRINT HT N 4+4-1. LET 4 3+6000 FFI 2 S 2 S 532 540 F42 LET रमें स्थापन LEW THE A W BEEK PRINT AT 8,5, MIDDILES REMA 2580 INING" MONE" the 30 THEN PRINT AT 10, 2562 2585 LET C 0 LET W. 100 2570 FOR a 1 10 (30 t) 2580 PLOT a 15+10-c, W 2550 PLOT 4 15 + 10 - C.W DRAW 1 DRAW - 1, 2 DRAW 0, -5 DR 2, -2 DRAW 2, -4 DRAW 0, 5 2 -2 DRAW 0 3 DRAW 6, -2 DRAW -1, DRAW DRAIL DE DRAL 2536 LET n n+500 19,34 AT STR# n.n BEEF .025,35 IF a=15 THEN LET 0170 IF a=15 THEN LET 01225 £538 2589 2590 NEXT a LET 95+0+4 2600 5.5 PRINT AT 21, 2605 IF 85 -100000 2610 THEN GO TO 26 40 2620 IF 55 - SUNCE THEN GO TO 264 GO TO 2700 IF VV-1 AND << 100000 THEN 2630 GO £640 10 TO 2700 2642 LET /V JV - VV + 1 IF 高額テニ6 THEN 60 TO 2700 2645 LET mm mm+1 2650 LET g(mm) ww 2660 PRINT FLASH 1, 1984 6,AT 1,0 , BCNUS CITY MAL. 2700 FOR a 1 TO 50 NEXT a INPU 2700 FOR a 1 TO 50 NEXT a INPU Press ENTER to Continue.... 704 IF 2705 IF 2710 LE IF XX-6 THEN GO TO 2717
IF XX=4 THEN GO TO 2715
LET XX=4 LET PP=34 IN
ER 4 BORDER 4 QUER 0
0 BRIGHT 0 FLACH 0 CES THE 0 PAPER 4 BORG THUE RSE 0 2711 GO TO 2720 2715 LET XX =6 KY = 6 LET PP = 50 BURDER 6 OVER 0 INK 0 PAPER 6 INVE FSE 2 BRIGHT 0 FLASH 0 CLS 2717 LET ×5 LET PP-42 INK Ø

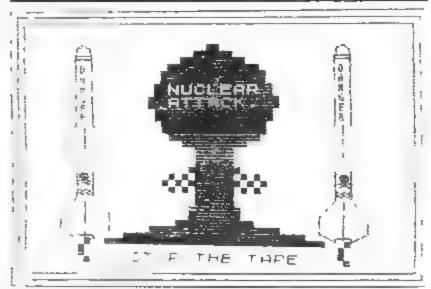
PAPER 5 COER 0 BORDER 5 INUE 3 BRIGHT & FLASH & CLS FOR a-1 TO mm LET tt-19 53E 0 LET 11-19(8) +31/8-2 LET 91" AT 21, tt, 2730 RINT 2735 LET WWW WWW. +1 LET 9 (W. PLOT 0,0 DRAW 255,0 GO SUB 6213 9 (11111) -128 2740 750 2760 TO 20 GO ad-1 THEN GO TO 160 ad-1 INK 8 IF 3000 LET ad-1 3001 3005 LET ac +0 CO TO 132 LET ac =ac 3006 PRINT AT 11, ac, .010 3011 396-11 3020 IF BTTR (11, ac+2) =PP THEN G O TO 5000 IF RMD: . . THEM SO TO 3050 IF ac>27 THEN GO TO 3050 LET ae=16+ac+3 LET af=(ac+ 1025 7030 3035 2) /4 3040 IF ae;q(a+)-6 AND ae;g(af++) N GO TO 3100 PRINT AT 11,ac," >>>"
GO TO 132 THEN 3050 3055 IF ac .29 THEM LET ad =0 IF 4d-1 THEN GL TO 3010 PRINT AT 11,0, 3260 2230 070 AT 9, x, "x 2030 IF 99: -ab THEN LET 1:=1 3100 3105 IF 5/10 THEN LET 5=5-1 5/10 THEN GO TO 3050 ĪF 120 99=44+1 ((b) 41 3130 LET LET 3140 3150 LET d(b) =9 (af) 15.4 LET e(b) -75 LET 1(b,1) -d(t 1160 1 (P 5) -80 PLOT J(6) 1,80 DRAW 1,-5 GO TO 3050 FOR a-0 TO 151 :165 3170 4000 READ b 4010 # +a , b 4020 POKE JSR NEXT a GO TO 11 4030 4035 4035 GD 10 11 4040 DATA 6,6,22,30,95,95,127,25 5,28,28,92,92,125,125,253,255 4050 DATA 0,0,64,96,104,232,250, 255,7,7,15,15,15,15,7,7 1060 DATA 224,224,240,240,240,24 4,224,224,0,0,0,0,0,0,1,3 4070 DATA 0,0,0,0,0,255,255 .0,0,0,0,0,123,192 4080 DATA 0,1,0,0,0,0,0,0,255,25 4080 DATA 5,1,0,0,0,0,0,0,0,255,25
5,255,60,0,0,0
4090 DATA 192,128,0,0,0,0,0,0,0,0,0
126,255,255,255,126,60
1100 DATA 0,0,24,60,60,24,0,0,19
,241,127,63,127,195,7,14
110 DATA 192,224,240,252,255,24
0,192,0,60,126,90,126,60,219,60, 4120 DATA 12,14,7,3,7,12,0,0,17
14,255,255 255,63,124,224
130 DATA 0,0,0,192,240,0,0,0
1000 LET a1=83 LET ah=ac*8+20
1001 PRINT AT 11,0," ",AT 9,x,"X' 5002 LET ay=1 5003 LET 95=55+3000 PRINT AT ". OVER 1, ", SVER 1, 78, 9, AT AT 0,10, 50 GO 70 5010 SCORE LET ah = d (a) IF at = 10 5004 7010 IF 41-10/174 OR 46-10(0 OR 46+10/255 THEN GO TO 5013 5011 GO TO 5014 5005 5013 BEEP .025.20 GO TO 5190 LET ak-0 ak-ak+1 5014 5015 5016 FOR W-1 10 5 STEP 2 PLOT ah-w,ai-W PLOT ah-w#2,ai 5020 DRAU 1.0 DRAU 1.0

5030 PLOT ah + w , a1 - w DRAIL 1,0 ah+0#2,ai 5035 PLOT 1,0 CRAU 5040 PLOT ah + 6 , a1 + 61 DRAW 1,0 5045 PLOT ah, ai+##2 DRAW 1,0 PLOT 5050 ah , ai +w *2 DRAW 5055 PLOT DRAU 5180 NEXT lat. IF 5182 INVERSE. ak=1THEN THEN BEEP IF 5183 .025,20 0 5015 ak-1IF 5184 THEN GO TO ak = 1 £185 INVERSE 5190 IF aj-1 THEN LET IF aj<>1 THEN GO ad =0 5192 aj () 1 THEN GO TO 8002 LET 3) - 8 GO TO 100 IF 10 - 30 THEN SO TO 7069 5195 5200 6000 6001 6002 LET D=x +8 112-kk LET r=170 - y +8 6003 PLOT DRAW 0,7 ०० १२ 5004 PLOT DRAW 0,5 00,99 6008 OVER O 1 PLOT 00-1,qq 00,qq DRAW 0,5 THEN LET 11=11-4 THEN LET kk=kk+2 INVERSE 010 DR PLOT FILE. 2,0 0.0 IF 6015 nn -0 IF 5018 THEN LET שֿבינות K. = K. X. + 21 - E +1.5 5020 ΤF nn-0 THEN LET nn 24-1141 5 6025 LET 6030 LET nn-nn-8 5040 LET 00 = k k + 116 LET qq=11+2 E. 0145. IF t (29 AND LL (Ø AND kk=21 GD SUB 5214 THEN S049 INVERSE FIGHT O FØ GO TO 7000 PAPER 5 BORDE R 0 INVERSE 0 BORDER FIGHT O DUER @ INVERSE @ C PRINT AT 10,4,"DO 900 want tructions? FOR #~1 TO 100 CLS ins NEX Lil. İF **b**\$="" 8051 PREIMMEAR THE N GO TO 6051 65-"9" OR 65-"Y" THEN GO 8052 IF TO 6054 (853 GO TO 6198 AB54 CLS IEFING" PRINT AT 0,9, "YOUR BR 5055 PRINT "YOU charge o are 3 T) Surface - to-Air Guided Missi 9 the outbreak OF te base at DUC ear war PRINT '"Your 6056 100 15 to defe and your own missil site from the nucle 5 cities nd launching dr missiles. 6057 PRINT You have THIRTY Missiles, up to 10 be at the launching TIA- GJ SOBS f these willbe at the site at any time, if O f if the site i hat, missiles present, all ill be destroyed. -058 PRINT Бe Carefre he last fire of tefence tonger you can hold off the the last 1 15 3 1 wolebeoble (90 tack the DE evacu ated. FOR W=1 NEXT 500 6059 TO Bi #1, AT 1,2, PRESS ANY INDE... PAUSE 0 KEY TO C ONTINUE..." NUES OLS AL DETAILS PRINT AT 0,6, TECHNIC 5061 PRINT ' The Surface-to-Air to the point that the mi Missiles m z explode...to dest Missile or Plane, the '"X"' in 8 di ssile is to roy a Nuclear YOU Lan move rections." E062 PAPER 6 PRI FOR w = 9 TO 21 NEXT W PRINT AT 1 س"ر ©رت

5063 PRINT INVERSE 1, 1 📭 📆 🚾 4

5 16 7 18 19 10 5 064 PRINT INCERSE 1, U 1", INK 5, P INCL INK 5, FR PAPER 0, 'E · 🔲 🖸 🦳 ' APER 6, IN: 2 . . , INE 065 PRINT THIR INF 214K 6066 PRINT INCERSE **S** D 1, Ħ , INS 3, 6068 PRINT INVERSE NK 4, "EX ES EV ", 1 INK 0," PRINT 112 4, 069 INK INK Ø, "

60/0 INK 8 PLOT 0,0 DRAW 255,0 DRAW 0,104 DRAW -255,0 DRAW 0,-104 PLOT 0,78 DRAW 255,0 6071 PRINT OUER 1,8T 9,0," KEYBO ARD DIAGRAM WITH KEY LES. 60/2 PRINT INK 1, INVERSE 1 8T 11,4,"LEFT INK 5. PAPER 0,"RIGHT, PAPER 6," INK 4."FIRE



The screen display you will be greeted with when you first RUN the game

73 FOR W-1 (O 500 NEXT W #1,AT 1,2, PRESS ANY KEY FINUE... PARSE 5073 FOR W-1 PRI TO PAUSE & ONTINUE. 5074 PAPER 5 PRINT AT 0,1 CLS ""For 6075 PRINT each Dissile ot down you or each city get 1000 points. and each Surface --Air Missile the end of remaining intact at a barage you reciev 50,00 after bonus points, 100,000 O à you recieve a bonus S076 PRINT 7 "YOU can Shoot m 1 5 5 1 while moving your down Les ites in any of 8 directions. xperince willshow you that it best to fireyour missiles in 13 sne path 1 D to of your target." T '''Good Luck..Your PRINT to need it 103 5078 FOR wall TO 500 ANY KEY TO CONTIN Ø GO TO 6198 3, 14, " 7, AT 4,12 5,11, " 6,11, " NEXT PRESS PAUSE PRINT AT UE. 6080 6031 PRINT AT 7,10, , AT 8,11, 6082 PRINT AT 9,11," AT 10,12, 11,14,

3,11, 6085 PRINT AT 18,7," DRAW 255,0 DRAW 55,0 DRAW 0,-175 L T 0,0 DRAW 0.35 FL 38 - PLOT 4,4 DRAL DRAW DRAW 247,0 10, N.C.EAR", AT 7,12, 'ATTRCK."
10, N.C.EAR", AT 7,12, 'ATTRCK."
1001 F. H 3 '44 TU 200 STEP 159
1002 P.OT a.150 DRAW 5,-9,PI
1004 P.OT a.150 DRAW 10, 10 DPA
5,5, 18AW 5, 10 DRAW 0,-20
18HU 10, 10 DRAW 0, 10 DRAW 1 DPA É_OT 134 BLOT 4,131 DRAW 0,-25 PC PLC .236 INK S PLOT & 2,137 DRAW 0, 3 DRAW 1,1 DRAW 0, DRAW -1,1 DRAW -1,0 PLOT a-2,125 DRAW 0,3 DRAW 1,1 DRAW 1,1 DRAW 1,1 DRAW 1,1 DRAW 0,2 DRAW 1,0 1007 PLCT a 2,122 DRAW 0,4 DR 2,-4 DRAW 0,4 PLOT a,120 D 2,-4 DRAW 1,1 DRAW 0,-2 DRAW 1,0 DRAW 0,2 2,-4 DRAW 0,4 PLOT a,120 DR

2,-4 DRAW 1, 1 DRAW 0,-2

CRAW 1,-1 DRAW 1,0 DRAW 0,2

E098 PLOT a,114 DRAW -2,0 DRAW

0,-2 DRAW 2,0 PLOT a-2,104 DRAW

0,-2 DRAW 2,0 PLOT a-2,104 DRAW

0,-2 DRAW 1,0 DRAW 1,-1 DRAW

1,-1 DRAW 1,-1 DRAW 0, 1

5099 INK 7 PLOT a-4,144 DRAW 2

5 PLOT a 4 142 DRAW 8,0

5100 PRINT AT 13, INT (a/8), 8"

5101 PLOT a 4,61 DRAW 1,0 DRAW

1,1 DRAW 1,0 DRAW 1,1 DRAW

1,0 DRAW 1,-1 DRAW 1,0 DRAW

1,0 DRAW 1,-1 DRAW 1,0 DRAW

1,1 DRAW 1,0 DRAW 1,1 DRAW

1,1 DRAW 1,0 DRAW 1,1 DRAW

1,2 DRAW 1,-1 DRAW 1,2 DRAW

1,3 DRAW 1,-1 DRAW 1,2 DRAW

1,4 DRAW 1,-1 DRAW 1,2 DRAW

1,5 DRAW 1,-1 DRAW 1,2 DRAW

1,6 DRAW 1,-1 DRAW 1,2 DRAW

1,7 DRAW 1,0 DRAW 1,2 DRAW

1,8 DRAW 1,-1 DRAW 1,2 DRAW

1,9 DRAW 1,-1 DRAW 1,2 DRAW

1,0 DRAW 1,-1 DRAW 1,2 DRAW

1,1 DRAW 1,0 DRAW 1,2 DRAW 1 ,1 DRAW 1,0 6105 NEXT 3 5108 PRINT # #1,AT 1,3,"PRESS ANY KEY TO BEGIN..."
6110 FOR #=50 TO 35 STEP -1
INKEY\$= " THEN GO TO 6130
6120 FOR #=1 TO 10 RUN 6130 BEEP .015, w. BEEP .025, RND *
100-35 BEEP .025, AND *50-25 BEE
P .025, RND *20-10, NEXT w
6140 FOR w=1 TO 10 NEXT w PAUS Ø RUN 6198 LET ak=1 CLS PRINT AT 10 .8,' "NUCLEAR ATTACK"" 6199 LET ss= 1 PRINT 'TAB 5,"pr ess any key to start". FOR w==1 70 12 BEEP .025,RND*100-40: BEE F .025,w*5 NEXT w PAUSE 0 CLS 6200 FOR Z=2 TO 12 STEP 4 6210 PRINT AT 21,Z," 11 " 6211 PRINT AT 21,Z+17," 11 " 6212 NEXT Z 6213 LET ak=1 GO TO 6328

6214 5215 5216 6217 +4) · a #4 / T215 LET WWW WWWW...5

5220 NEYT & OVER 0

6221 IF ak:1 THEN GO TO 6229

5222 IF t>=19 THEN GO TO 6225

5223 POKE 23280,63 POKE 23281,6

3 POKE 23282,63

5224 GO TO 6229

6225 POKE 23276 63 b. 16 6225 POKE 23276,63 POKE 23277,6 3 POKE 23278,63 623 LET ak = 0 6230 PLOT 0,0 DRAW 255,0 6240 LET kk = 9 LET (1 = 12 LET AA = 0 LET oo = 125 LET 99 = 14 6290 IF ss = -1 THEN GO TO 20 RETURN GO TO 7000 6300 6310 5330 RESTORÉ 6430 6340 PLOT 0,0 DRAW 255,0 5350 FOR a=20687 TO 22223 STEP = 56 POKE a,60 6360 6370 NEXT a 6380 POKE 22479,126 5390 FOR a=20719 TO 6370 NEXT TO 22299 STEP 2 56 F.4.00 5410 POKE 8,6 6420 NEXT DATA 255,231,231,231,231,19 5430 5,129 6440 FOR a=20/16 TO 22296 STEP 2 56 6450 READ b,c,d 6460 POKE a,b. POKE a+1,c POKE a+2,d POKE a+4,b POKE a+5,c OKE a+6,d 6470 NEXT a 6480 DATA 132,33,8,115,156,231,1 32,35,6 6490 DATA 0,0,0,132,33,8,115,156 ,231,132,33,8 6500 POKE 23247,8 ** x + / 6510 POKE 23279,8 ** x + / 6515 FOR a - 0 TO 6 6520 POKE 232/6+a,56 IF a 2 THEN LET a = 3 NEXT a 8530 6540 5900 GO TO 6214 7000 IF t)=30 THEN GO TO 7059
7001 LET 575+1 LET (-t+1 LET (5)=4 LET q(5)-4
7005 LET 55-1
7010 INK 2 OVER 1
7022 FOR W=3a TO 5
7025 PRINT AT W(W), q(W), "." LET 16 7430 NEXT W LET a3 = a a + (w a a a)

BEEP .01,35

FOR w - (c TO s

PRINT AT m (w) . q (w) . " • PRINT AT m (w) , q (w , ' •) 7031 7032 7035 7038 348 9161-1 NEXT W BEEP .01,35 2066 7067 LET ee ee + (w - ee)
INK 8 OVER 0 GI
INK 2 OVER 1
FOR w ff TO 5 7968 GO SUB 100 7069 20.20 7071 PRINT AT m (wi,q w,, "."

75 PRINT AT M(W), q(W) -1, m(W) -1, q(W) -1, ", AT 7075 9 (6) -1, NEXT 080 7081 LET ff=ff+iw-rf1 7082 5:30 THEN GO TO 7084 INK 8 2083 OVER @ 68 308 100 TNK 2 OVER 1
FOR w =99 TO 5
PRINT AT m(w), q(w), "."
PRINT AT m(w) q(w), "." 7084 7085 7088 7095 NEXT W LET LET 97=99+(0-99)
IF 5=30 THEN 60 TO 7099
INK 8 00ER 0 60 508 100
INK 0 00ER 0 2096 1097 2098 OVER 20 YO 100 PRINT AT m (w) , q (w) -1," 7105 7 PRINT AT 7109 PRINT OVER 1, AT m (w) +1,q(w) 7110 NEXT W 7120 LET hh=hh+(w-hh) 7130 PRINT INK 0; OVER 0,AT 7135 PRINT AT 0,10,"
", OVER 1, INK 9,AT 0,10;"50 "LET ORE 7140 bb=0 7150 INK INVERSE Ø. OVER Ø. 0 100 LET dd=1. OVE FOR w=1 TO mm 7200 OVER @ 7210 IF d(a) (g(w) +8 AND d(a))g(w) THEN GO TO 7231 NEXT w GO TO 7996 7220 1 ~8 LET tt=(d(a)+3)/8-2 PRINT AT 19.tt+1;" ",AT 21,tt," 7235 7240 ",AT 20, 7260 LET UU =9 (w)
7260 LET UU =9 (w)
7260 PLOT UU-4,1 DRAW
UU-2,2 DRAW 3,0
7275 PLOT UU-5,2 DRAW
UU-7,1 DRAW 13,0 PLO DRAW 255,0 PLOT 00-2,2 D 7275 PLOT 00-7,1 D DRAW 3,0 DRAW 9,0. PLOT PLOT uu-2,3 280 PLOT 00-4,3 DRAW 7,0: PLOT 00-5,2 DRAW 11,0 PLOT 00-2,4 DRAW 3,0 PLOT 00-9,1 DRAW 17, PLOT 00,5 7280 PLOT 0 PLOT 00 1,5 PLOT 00,5 PLOT 00,5 PLOT 2285 PLOT 00-5,4 DRAW 9,0 PLOT 00-4,5 UV-6,3 DRAW 11,0 PLOT 00-4,5 DRAW 15,0 PLOT 00-3,6 DRAW 5,0 PLOT 00-1,7 PLOT 00,7 7286 OVÉR VÉR 1 INK 8 PAPE PRINT AT 21,tt-1, RINT AT 20,tt-2," PAPER 7 BRI и, PRINT

Here we have a screen illustration of the of scoreboard

SCORESOARD

	SCORE	MAME
1	33000	A50h (maus
; 2	21000	Low-Scote FREE
3	Ø	

YOU HAVE THAT THEFT I DOUBLE.

Please Enter your name.....(up to 14 (etters)"

AT 19,tt-1," ,AT 17,tt+1," " 7288 BRIGHT 0 OC ",AT 18,tt, OVER 1 INK 8 PA PER XX PRINT AT 21, tt-1,"
7290 PRINT AT 20, tt 2,"
AT 19, tt-1," ", AT 18, tt, PER XX AT 19, tt-1,"
", AT 17, tt+1,
7292 OVER 0
7294 PLOT 00-192 OVER 0' 194 PLOT UU-7,5 DRAW 13,0 PLO UU-7,6 DRAW 13,0 PLOT UU-8,4 DRAW 15,0 PLOT UU 6,7 DRAW 1 DRAW 15,0. PLOT UU 6,7 DRAW 1
1,0. PLOT UU-8,3 DRAW 15,0
295 PLOT UU 5,8 DRAW 9,0 PLOT
UU-9,2 DRAW 17,0 PLOT UU-3,9
DRAW 5,0 PLOT UU-13,1 DRAW 25
20 PLOT UU-1,10 PLOT UU-10
200 PLOT UU-8,7 DRAW 1,0 PLOT
UU+6,7 DRAW 1,0 PLOT UU-9,6
DRAW 1,0 PLOT UU+7,6 DRAW 1,0
PLOT UU-8,6 DRAW 2,0 PLOT UU+
5,8 DRAW 2,0 PLOT UU+
5,8 DRAW 2,0 PLOT UU+
5,8 DRAW 2,0 PLOT UU-7,9
DRAW 13,0 PLOT UU-7,10 DRAW 13
DRAW 13,0 PLOT UU-7,10 DRAW 13
DRAW 13,0 PLOT UU-7,10 DRAW 13 7305 PLOT UU-9,5 DRAW 1,0: PLOT UU+7,5 DRAW 1,0 PLOT UU-7,9 DRAW 13,0 PLOT UU-7,10 DRAW 13,0 PLOT UU-11,2 DRAW 1,0 PLOT UU-15,1 DRAW 1,0 PLOT UU-4,12 DRAW 7,0 PLOT UU-15,1 DRAW 1,0 PLOT UU-4,12 DRAW 7,0 PLOT UU-15,1 DRAW 1,0 PLOT UU-4,12 DRAW 1,0 PLOT UU-10,8 DRAW 1,0 PLOT UU-9,9 DRAW 1,0 PLOT UU-10,7 DRAW 1,0 PLOT UU-9,9 DRAW 1,0 PLOT UU-10,7 DRAW 1,0 PLOT UU-8,7 DRAW 1,0 PLOT UU-8,7 DRAW 1,0 PLOT UU-8,7 DRAW 1,0 PLOT UU-8,1 DRAW 1,0 PLOT UU-8,1 DRAW 1,0 PLOT UU-8,1 DRAW 1,0 PLOT UU-8,1 DRAW 1,0 PLOT UU-8,1 DRAW 1,0 PLOT UU-8,1 DRAW 13,0 PLOT UU-7,13 PLOT UU-7,13 PLOT U 13 13,0 325 PLOT 325 PLOT UU-10,3 DRAW 1,0 PLO UU+7,3 DRAW 1,0 PLOT UU-5,14 DRAW 9,0 PLOT UU-14,2 DRAW 2 0 PLOT UU+10,2 DRAW 2,0 330 PLOT UU-3,15 DRAW 5,0 PLO UU-1,16. PLOT UU,16. PLOT UU-1 , 1 1,0 7335 INVERSE PLUT_UU-18,3 1 DE HL 0, 1 DRAU 1,0 DRAU 0,. AU 1,0 DRAU 0, 1 DRAU 2,0 T UU+9,8 DRAU 0,-1 DRAU DE 1,0° OU +9,8 DRAW ORAW 0,-2 DRI DRAW -2,0 340 INJERSE 0 DRAW -1,0 JEASE Ø PLOT GG 10,10 D L DRAW 1,0 DRAW Ø,2 DRA DRAW Ø,1 DRAW 2,0 PLOT DRAW Ø,1 DRAW 1,0 D DRAW Ø,1 DRAW Ø,1 DR 2340 ទគណ ២,1 U 1,8 υυ **+9,10** 5,0 WAR AU -2,0
7345 PLOT 00-8,15 DRAU 15,0 PL
OT JU-7,16 DRAU 13,0 PLOT 00-5
,17 DRAW 9,0 PLOT 00-3,18 DRA
U 5,0 PLOT 00 1,19 PLOT 00,19
7350 INVERSE 1 PLOT 00-10,11 D PAU 0,-1 PAU 0,-1 DRAU 1,0 DRAU 0,-2 PAU 1,0 DRAU 0, 1 DRAU 2,0 .T UJ+9,11 DRAU 0, 1 DRAU 0 DRAU 0,-2 DRAU -1,0 DRAU FL 7352 PLOT 00 8 0. 352 PLOT 00 8,6 DRAG 2,0 00+4,6 DRAG 3,0 PLOT 00-10 PLOT 7355 INJERSE 0 FLOT 00-10,13 0 AAU 0,1 DRAW 1,0 DRAW 0,2 DRAW 0,0 PLOT 00+9,13 DRAW 0,1 DRAW -1,0 DRAW 0,1 DRAW 7355 DRA \$1,0 DRAW 0,1 DRAW 2,0 PLOT UU+9,13 DRAW 0,1 DRAW 2,0 PLOT UU+9,13 DRAW 0,1 DRAW 0,1 DRAW 0,1 DRAW 0,2 DRAW 1,0 DRAW 0,1 DRAW -2,0 PLOT UU-8,18 DRAW 15,0 PLOT UU-5,20 DRAW 9,0 PLOT UU 3,21 DRAW 5,0 PLOT UU 5,2 PLOT UU 3,2 PLOT UU 5 4 PLOT UU+5,4

370 INVERSE 1 PLUT LL-10,14 D. SAU 0, 1 DRAU 1,0 DRAU 0,-2 D. FAU 1.0 DRAU 0, 1 DRAU 2,0 PL CT LL+9,14 DAHU 0,-1 DRAU 1,0 DRAU 0,-2 DRAU 1,0 DRAU 0, 1 IRAW 12,0 375 INVERSE 0 1 DRAW 2,0 1392 PLOT US 3,12 DRAW 3,0 PL 10+4,12 DRAW 3,0 1395 INVERSE O PLOT OU-10,19 PAW 0,1 DRAW 1,0 DRAW 0,2 DRAW 0,1 0,1 DRAW 0,1 DRAW 2,0 PLOT UJ+3 13 DRAW 0,1 DRAW 2,0 PLOT UJ+3 13 DRAW 0,1 DRAW 0,1 D DRAW 3,0 PLU DRA →AW 0,2 DE 400 PLOT 00-3,24 DRAW 15,0 of Ju-7,25 DRAW 13,0 '402 PLOT 00-8,10 DRAW 3,0 '00+4,10 DRAW 4,0 DRAW 15,0 Pί PLO 7 00 44,10 DRAW 4,0
7405 PLOT UL 5,26 DRAW 9,0 PLO
7 04-3,27 DRAW 5,0 PLOT UU-1,2
7 PLOT UU,28 INVERSE 1 PLOT
7.5 DRAW 1,0 DRAW 0,1 PLOT
1410 PLOT UU 5,7 DRAW 0,-2 PLU
7410 PLOT UU 5,7 DRAW 0, 1 PLOT
1415 PLOT UU 10,20 DRAW 0, 1 PAW
7415 PLOT UU 10,20 DRAW 1,0 DRAW
7415 PLOT UU 10,20 DRAW 1,0 DRAW
7415 PLOT UU 10,20 DRAW 1,0 DRAW
7415 PLOT UU 10,20 DRAW 0,-2 DRAW 0,-2 DRAW 0,-1 DRAW 2,0 PLOT UU+9,20 DRAW 0,-1 DRAW 2,0 PLOT UU+9,20 DRAW 0,-2 D 7 60 +4 10 7405 PLOT DRAW 4,0 1420 INVERSE @ DB96 6,5 PLUT RAW 0,1 DRAW 1,0 DRAW 0,2 DRAW 1,0 DRAW 0,1 DRAW 2,0 PLOT 20+9,22 DRAW 0,1 DRAW 1,0 RAW 0,2 DRAW -1,0 DRAW 0,1 DRAW 0,1 DRAW 0,2 DRA DE AU -2,0 AU -2,0
7425 PLOT UU-8,27 DRAU 15,0 PL
OT UL-7,28 DRAU 13,0
7430 PLOT UU-5,29 DRAU 9,0 PLO
T UU-3,30 DRAU 5,0 PLOT UU-1,2
5 FLOT UU,31 INVERSE 1. PLOT (
U-8,15 DRAU 4,0 PLOT UU+3,15
[RAU 4,0 PLOT UU-7,14 DRAU 3,0
PLOT UU+3,14 DRAU 3,0 7435 PLOT UU+8,10 PLOT DRAL 0,1 DRAW 0,1 DRAW -3,0. DRAW -1,1
DRAW 1,1 DRAW 1,-1 DRAW 1,1
DRAW 1,-1 PLOT UU+3,7 DRAW 0,1
DRAW 3,0 DRAW 1,1: DRAW -1,1
DRAW -1,-1: DRAW -1,1: DRAW -1,
-1 PLOT UU-6,11 DRAW 2,2 PLOT DRAU -1,-1: DRAW -1,1 2,2 PLO -1 PLOT UU-6,11 DRAW 2,2 PLO UU+5,11 DRAW -2,2 /440 PLOT UU-4,11 PLOT UU+3,11 /450 INVERSE 1 PLOT UU-3,13 D AU 0,1 DRAW 1,0 DRAW 1,-1 DR U-2,-2 PLOT UU,13 DRAW 1,1 FAU 1,0 DRAW -5,-5 /450 PLOT UU-4,6 DRAW 6,6 PLO DR DRA RAU 1,0 DRAW -5, 5 7460 PLOT VU-4,6 DRAW 6,6 PLOT UU-4,4 DRAW 6,6 PLOT VU-2,4 DRAW 4,4 PLOT VU,4 DRAW 2,2 7470 PLOT VU+2,4 DRAW 1,1. PLOT UU+4,4 DRAW 1,0 PLOT VU-6,4 อัคคัน 19,0 เซี 3 PLOT 00-10,3 DA 7480 FOR # = 0 TO 7490 IF W=1 THEN GO TO 7550

.0

1

5

T

+

T

0

1

O

12

D

1

042 0

r

C>

7500 PLOT 00-10,26-# ORAW 9,9
DRAW 10,-10 PLOT 00-10,22-# DR
AW 9,9 DRAW 10,-10. DRAW -4,-4
PLOT 00-8,20-# DRAW 7,7. DRAW 8,-8 7510 PLOT RAW 5,-5 00-7,17-W DRAW 6,6
PLOT 00-4,16-W. DRAW
3,-3 PLOT 00-8,22-W
DRAW 9,9
00-8,26-W. DRAW 7,-7
PLOT 00-6,28-W. DRAW
5,5 PLOT 00-4,30-W PLOT ,3 DRAW 3 RAW 7,-7 7520 PLOT 7.7 DAAW DRAW 5,5 PLO DRAW 3,3 5 KHW. 7550 PLOT UU-14,2 DRAU 27,0
7560 PLOT UU-14,2 DRAU 27,0
7560 PLOT UU 2,13 DRAU 4,0 P
1 UU-3,8 DRAU 4,0 DRAU 1,-1
RAU 4,0 DRAU 1,-1 DRAU 6,0
DRAW -1,-1 DRAU -6,0 DRAU -1
1 DRAW 8,0
7500 PLOT UU 17 3, -3 DRAW -6,0. DRAW -1,-1 DRAW 8,0 7600 PLOT UU 17,1 DRAW 33,0 7610 PLOT UU-5,13 DRAW 1,-1 AW 7,0 DRAW 1,1 PLOT UU-7,11 DRAW 13,0 DRAW 1, 1 DRAW -18 DRAW 1,-1 DRAW 13,0 7810 PLUT DRAW 1,1 PLOT 00-7,11
DRAW 13,0 DRAW 1, 1 DRAW -15,0
DRAW 1,-1 DRAW 13,0
7620 GO TO 7500
7985 IF 9(22)-128 THEN LET 1=30(INT (2.9-1/10)) *10
7986 IF 9(22)=128 AND 1 (30 THEM DP LET rr=1 7987 IF g(zz) =128 AND t:30 THEN GD TO 8002 7989 IF g(zz) <>128 THEN LET ww=g 1 (4) 7990 FOR w=zz TO mm-1 LET 4 (w+1) NEXT w LET mm=nm-1 7996 PLOT 0,0 DRAW 255,0 7999 GO TO 3002 6000 LET ss=ss+1000 6001 GO TO 5005 LET g(W) = 8001 GO {U 5005 8002 OVER Ø INVERSE 1 PLOT 1(a ,1),1(a,2). DRAW d(a)-i(a,1),e(a 1-1(a,2) d010 PLOT 1(a,1)+(1(a,1),255),1(a,2)-(1(a,1),255) DRAW d(a)-1(a ,1),e(a)-i(a,2) 6020 PLOT : (a,1) - (i (a,1) >0) ,: (a, 2) - (1 (a, 1) =0) DRAG 3 (a) -1 (a, 1); e (a) -1 (a, 2) INVERSE 0 =030 PRINT AT 0, 10, " OVER 1, INK 9, AT 0, 10, "SC ≥) - (i (a, 1) ±Ø) ORE ", SS 3035 IF dd=1 THEN PRINT AT 9,x," 5038 LET dd=0 FOR WES TO B 5040 8045 LET h = # + 1 3050 LET e (w) /e (h) LET 8053 d (w) ≈d (b) NEXT W LET bab-1 8056 3358 2059 3060 8070 IF (=1 THEN GO 308 6214 LET (=0 GO TO 100 8080 8090 9500 STOP 9000 CLEAR SAVE "missite" LIME 10 9005 9010 9999

EH characte, a d c te pindin. eite fen enteting the sur a , ... hen enteting the fur a , ... hen enteting the fur a , ... hen app in late tite. ... yped in whehill belek.

APO DE FON IUN E H NO P JRS

the chould be taken to efter the collect > when typing in

Seriously now...

A look at some 'serious' software packages for the ZX Spectrum by Peter Shaw.

The packages reviewed here have no deep connection their only common theme is 'non games' it will deal with the character designers and character enhancements first

Multifont 16/48K Spectrum Image Systems

This program as the terature supplied with the cassette says, For the first time ever allows the user an instant choice of six specially designed fonts. Well it would hardly call it instant as the code has to be loaded from tape. But the six fonts included are quite well designed.

The six sets include Ex tended Bold which also has a full ower case set, and can be used as an alternative to the Sinclair set. This the histructions say demonstrates that true descenders are possible on the Sinclair. The other sets are "Modern", a square typeface which will match most applications. Serif, a classical formal serf style, Lodestone' sim ar nisty e to that used in the Quicksi va's Time Gate' a computer style (although I know of no computer which uses it) and Standard Boid This last style s one of my favourites (the other is Serif it is chanky and very neat t is quite readable and has many applications. The ast set, Greek can only really be us ed for equations letter I think this package would have been greatly complimented by Including different styles like 'Script or 'Gothic but the six provided make for a useful col

At a x sets can be stored in the computer at the same time and can be called by two POKEs. The demonstration cassette unfortunately didn't work - a CLEAR command had been omitted which made the Spectrum crash (but in sure this will be remedied on commer cial versions). After a few adjustments I got the program to work and then converted it easily to the ZX Microdrives. It is very pleasing to program in such an

elegant typestyle but perhaps £4.95 is just a little much for the

Image Systems 185 Em Road New Malden, Surrey KT 3HX Te 01 942 7138

Character Designer 48K Spectrum Procom

The second character enhancement, which a so uses the whole character set was not without its problems. The software supplied like Multifont, had some bags and some pretty big bugs at that

The instructions helped me in no great way, and I had very Itte idea as to what was supposed to be doing soon sussed that the program was an m proved version of the character generator you get with the 'Horizons introduc tion tage. Improved because it enables you to redefine the whole set, not ust the user defined graphics, when I say 'improved don't mean the program tself is better. Apart from the bugs the program is slow and messy if the programmer had spent a little

more time with the program, Procom might have a good product

Having already written a character generator program myself find thard to unders tand how they make it so slow

Procom Museward Ltd 309 High Road, Loughton Essex Tel 01 508 1216



Sales Ledger 48K Spectrum Kemp Limited

Of all the programs reviewed this was by far the best presented A was contained in a smart video cassette type box, which held the instructions and tape, plus an extra space for your own taped file.

The program itself had a very professional fee allowing for full manipulation of your accounts. The screen display was green on black lare Kemp trying to emulate the green screen display of the larger machines? With a blue border

The 'Sales Menu had at the usual choices lie Display account Update account Correct account Create etc., plus full use of a printer it say 'a printer and not the ZX Printer because with Sinclair's new RS232 interface you could put an Epson or as used, a Tendy or daisywhee Unfortunately, the way the software printed was a little confusing all crushed together see the example pointout in Fig. 1.

The file handling was fast and the program itself was very well written and as opposed to other instruction bookiets this one was extremily well put together. With a good printer attached to the Spectrum, this program at ast makes business software viable on the Sinciair.

CHARACTER DESIGNER

by PROCOM

Runs on 48k ZX Spectrum

SPECTRUM

020983 Fig 1 An example of the output from the program Sales Ledger, from Kemp Ltd.

DATEREFULALILNET 2,9,83rl 2,5050,00 3,9,83r2 250,005000,00

Total 5802,50252,505050.00

TOTAL DUE 5802.50

NOTE: BYF TOTALS INCLUDE U.A.T.

if you don't pay up within 10 days I'm send the boys round.



sl

d

90

E

ľà

à

g

14

ĮÞ

n

þr

10



The price of Kemp's Sales Ledger package is £14,95

Kemp Limited 43 Musewell H., London N10 3PN Te 01:444-5499

Masterville 48K Spectrum Campbell Systems

Masterfielis as tsiname suggests a comprehensive filing system which will store anything you choose and retrieve in the manner you wish. The example program supplied was a personnel file, which supplied the deepest secrets about BA Campbell's shoe size.

Masterfile lets a user display the fies in any way he or she wants, the example program had four different displays, but by the look of things fils possible to have 36

displays in full colour using high resolution displays. The file itself is very fast one of the few to be nearly written totally in machine code.

The program is completely menu driven (which is a great help if you have a memory tke mine and can store 26 tems per record with 128 characters per tem.)

Masterfile is based on the ZX81 program. 'The Fast One which is used by many 81 owners at over the world Masterfile is pedigree is sure to make it set. The price of the package is £15.00.

Campbel Systems 15 Rous Road, Buckhurst HT Essex G9 68L

Bank Account System 48K Spectrum K.J. Gouldstone

By the way this tape was presented (the user manual is photocopied with a Sinclair printout on the front and in the insert) wash tilexpecting anything great but, to my surprise, the program is in fact, pretty good lit will store as bank transactions standing orders etclassively as cope with Cash cards cheques nor mall pay etc. Quite a useful tool really

to be something wrong with the tape I received. Either it cannot add up or the program has a major bug along the line

labourously entered a my bank transactions since May not the program updated the file and then asked for a prinitual of my statement from ourse 5th All got was

BANK STATEMENT 04:09:83 DATE TYPIREF VALUE BALANCE UPENING BALANCE OD URRENT A/C BALANCE EJ 00

Now know how much I have in my account and it isn't anything like £0 or at east hope not. A little more in vestigation showed me that a my transactions were not yet installed in the main file.

saved the file just in case I crashed it then returned to the program. Behold! Somehow haif of the transactions were now in the main file. This was still a bit useless unless I wanted to know the state of my account two months ago. At the time of writing this I have still not worked out whether tills me or the program that isn't working correctly but after a few phone calls that figure it out.

The price of this package is

Mr. K. J. Gouldstone 45 Burleigh Avenue, Wallington, Surrey SM6 7JG

JUST AROUND THE CORNER, A NEW

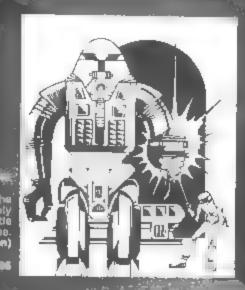
BLACK CRYSTAL











ZX COMPENDIUM













CARNELL SOFTWARE LTD.,

- splands Ind. Est., Molecey Road, Hersham, Surrent LLL

W RANGE FROM CARNELL SOFTWARE



COMING SOON

cariesta de la companya del companya de la companya del companya de la companya del companya de la companya de la companya de la companya del companya de la companya del companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya del companya de la companya del companya del companya del companya del companya del companya del companya del companya del companya del companya del companya del companya del companya del companya del c

The second secon

Control of the Contro





ZX User Group

Dear ZX Computing Within the activities of the International Scientific Scientific Research 'Verein Zur Förder ung Wissenschaftlicher For schungle Villacomputer club is being supported, which speci-I ses in Sinclair computers.

This Sinciair User Club publishes a monthly magazine, the ZX JSER, which contains information about ZX hard and software presents programs and circuits, and offers the club members the possibility of advertisements free of charge

For club members we are also offering package orders, which reduces the cost of ZX products.

We established a telephone 'hot line for technica problems telephone Austria 0222/44-32 050

The ZX User Club holds monthly meetings in Vienna, every first Friday of the month (Piease call for information regarding location and time)
Yours faithfully,

Thomas Christian, c/o Wissenschaft Forscht e V, Postfach 141 A-1190 Vienna Austria

ZX Micro Club

Dear ZX Computing We are very proud to announce to you the creation of our microcomputer club called ZX Micro Club. It will be open to ali Belgian Spectrum owners.

Our members will enjoy many profits such as a monthly contact bulætin mitiation courses to BASIC programming and weekly meetings are also planned.

We presently have three Spectrums (48K), three TV monitors, an Alphacom 32 printer and a range of hardware, as well as about hundred cassettes of various computers programs.

wish to find out more information about our club, please contact me at the address given below Yours faithfully,

Michael Hun.n, 6 Boulevard Leopold II, Bte 15, B 1030 Brusseis. Belgium

Doncaster And District Sinclair User Group

Dear ZX Computing, May we introduce ourselves to your readers as a newly formed user group for Doncas ter and surrounding district.

New members will be welcomed at our Wednesday meetings (note that there is no meeting on the first Wednesday of each month. The meet ings are held between 7 and 9 pm in the St Andrews Hall, Morley Road, Wheatley, Doncaster

Our present membership includes a good cross-section of users of various ages and programming ability. Therefore no-one, be they male, female, child or pensioner, novice or expert should fee out of place

You can either contact myself at the address given at the bottom of this letter, or contact the Software Secretary, Tony Cooper, on Doncaster 853124 or the Honarary Secretary, Russel Ward, on Roth 812334 Yours faithfully,

John Woods (Chairman), 60 Dundas Road, Wheatley, Doncaster Te Doncaster 29357

Birmingham

Dear ZX Computing, own a 48K ZX Spectrum and would like to join a user group in my area. Piease could you Should any of your readers ask anyone who is already a

member of a club in my area to contact me at the address given be ow. Thank you. ours faithfully,

Nathan Carnie, 27 elmf eld Crescent. Moseley, Birmingham B13 9TL

NSW Spectrum Users Group

Dear ZX Computing, am endeavouring to set up a Spectrum computer club in the Sydney region of Australia, and was wondering if you would please publish this letter in Club corner so that your Australian readers may see it.

The club meets once a month, and exchanges deas. programs, demonstrates new software and hardware, etc.

At the moment there are not very many members of the club, but we do hope to have many more. We also occasionally publish a small newsletter, with the latest Australian computer news, software reviews and programs.

If there is anybody interested in o ning our club, could they please ring me on

(02) 477 4299

or write to us at the address below Yours faithfully

Brendan Walker, N S W Spectrum Users Group, 88 Old Berowra Road, Nornaby, N.S.W., 2077. Austral a

Beaconsfield and District Computer Club

Dear ZX Computing, have just formed the Beaconsfield and District Computer Club, the first meeting having Just taken place on September

I had over 150 enguir es onginally, the result of the co-operation of the local library and small shops Fifty of the enguirers filled in the questionaire had prepared and from these, am happy to report that 30 have decided to on the club.

ZX Spectrums dominate, but BBC Micros come a close second with V C 20s following. The main age group of the club is between 14 and 17, although we do have a number of interested adults who come along to meetings. The majority of members are interested in learning to program effect ively so this will be one of our priorities when we begin tostructure the club's operation

Although we have had three appearances in our ocal paper would be very grateful if you could give us some extra publicity If any of your readers would like to find out more about our club could they please send an SAE to me at the address below Yours faithfully,

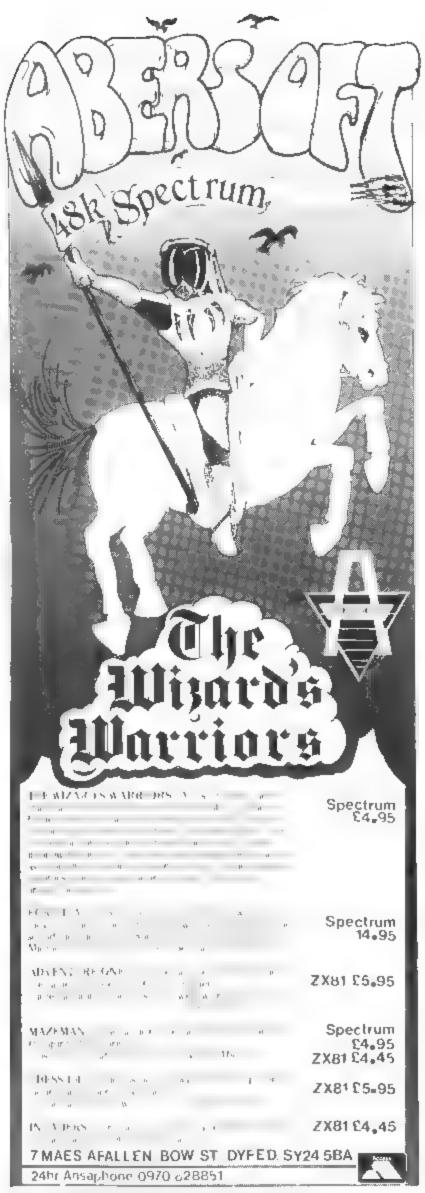
James Wilen. 2 Wilton Road, Beaconsfield. Bucks HP9 2BS

If you run, or are a member of, a user club which caters for the Sinclair user why not get your group on the map by writing to us at

Club Corner, 2X Computing. 145 Charing Cross Road, London WC2H 0EE

Ali you have to do is to send us a letter of your club's activities times of meetings, addresses of who to contact, etc.) and we'll do the rest. If you publish a newsletter or club magazine, we'd very much like to see that

And if you don't see a club in your area, why not start one up by writing to ZX Computing and seeing if any like minded enthusiasts wish to join you



CO-

агу

the

on-

om

hat he

out

50-

ng

ub

gh er лg of

10

ct-

Hall

b. n. ee 91 DLi **г**а

rs re ey ät

ıė ur to

25

9,

Sinclair Spectrum

KUMA SOFTWARE KUMA SOFTWARE KUMA SOFTWARE

MAP OF UK

Alia ye scale 75 x 60 mile scroling map is no w available. on the 48K spectrum it is easy to use and extremely fas. The program also includes a game using a dofting to all balloon. Educational and entertaining

E11 95 including VAT

ZEN EDITOR/ASSEMBLER

Zen enables you to write assemble led land run. programs in Z80 Assembly language. These operate. laster and take up considerably less memory space. than Basic programs. A must for the serious beginner

£12 50 including VAT

THE CRYPT

Can you covect the four keys of chaos and deteat the Demon Lord? The Crypt's an exciting venture on the £B,00 including VAT 48K spectrum

FOOTBALL FORECAST

Stoles up lo seven leagues and 130 teams allowing you of hierast lesuits using a unique system developed by Professor F. George £15.00 including VAT £15.00 including VAT

HORSE RACE FORECAST

uses past and present laces and if formation to fore cast the chances of a horse winning. Can you afford to be without this program?

£15.00 no oding VAT

SEND OR PHONE NOW FOR DETAILS KUMA COMPUTERS LIMITED

11 York Road Ma denhead Serkshire

Te. (0628) 71778

Access and Barclaycard we come



The finest range of utility programs for ZX Computer

ZX SPECTRUM MACHINE CODE SYSTEM (The key to machine code success) Used by professionals | Very useful for beginners

SPECTRUM EOVIDA ASSEMBLER A powerful and assembler code programming aid

the animal state of the animal animal state of the an SPECTROM EQUIDA ASSEMBLER A powerful and assemble machine code programming aid to hard like and assemble are the second of the s

SPECTRUM MONTOR Machine Code Debby/Disassembler

SPECTRUM MONTOR Machine Code Debby/Disassembler

Enter hear herring of a round arms in properties with grant order on the same of code manual DNLY 67-50

(Building of the properties of the code Debby/Disassembler of the same of the code manual DNLY 67-50

(Building of the code Debby/Disassembler of the code of the c

ZX81 UTILITIES

(For everyene . . . beginner to professional) EXECUTE STORM IN THE USE EXECUTE TO A PART OF THE PROPERTY OF THE PART OF THE

SMERKATON TO BAKE TO SERVE THE PERMITTING OCCUMENTATION TO SIGN MATURE TO SERVE TAKE MACRIME COOK DEBUG. MONTHS

TABLE ZX. MC Macrime Cook Debug. Months

THE OUTSESSION TO THE PERMITTING THE SERVE TO THE SERVE THE SE Days manual and lasteins. UNLY \$7.30 49 in bax.

7.781 SCREEN XIT 1 Mars screen power in your BASIC programs. L. AP and PLYENSH Part of the BASIC PROPERTY AND LASTE LASTE TO BE BASIC. In 9 birth tools L. AP and PLYENSH Part of the BASIC.

BONNESS ANYWhore and Side of the Mars of the BASIC.

ASHING UNSURE SURED SO BUILDING THE BONSE BASIC.

SOUTH SURED SO BUILDING THE BONSE BASIC.

TOUR STREET BASIC BASIC.

TOUR SURED SO BUILDING THE BONSE BASIC.

TOUR SURED SURED SO BUILDING THE BONSE BASIC BASIC BASIC.

TOUR SURED SURED SURED SURED SURED SURED BASIC.

program ONLY E5 TO AF II 649 SEND CHEQUE/P O FOR FAST MAIL ORDER!

6 Corkscrew HVI West Wickham Kent BR4 988

Speckrym Collegen gegliebte frem Butter Miere Streitham Mieramen speckrym Educational augichum Griffin & Gaerge

Smaug's lair

Can you destroy the dragon's lair in this program written for us by Norman Brooks of Kent.



You are the Gunner Captain on a mission to destroy the dragon's castle

You have five cannon and 12 cannonbals at your disposa to be were

the sound of your guns will wake the dragon. When he flies time stands still and although he has poor eyesight, he will breathe file and try to destroy a of your weapons of he does run for your life.

To dislodge the most bricks hit the castle as high as you can by carefully choosing how much gunpowder to use and what angle to set the cannon at if 6 000 bricks fall then the castle is in runs and Smaug must seek a new wormhole Good uck.

Cannon and ball

When you first RUN this program you are asked if you require instructions in the usual way If you reply lives it? you are given a bir of introduction to the program to get the adrenal nup

Then the Battle Status screen is shown and is return ed to throughout the game You are shown the current scores and the castle will be demokshed in proportion to the number of bricks you have knocked out. At the top of the screen, you see how far the computer has set the cannon from the castle ready for your first shot, this is random bet ween 500 and 2,300 metres). You are then invited to enter the size of the gunpowder charge (25 to 35 bs) and what angle of elevation you wish the

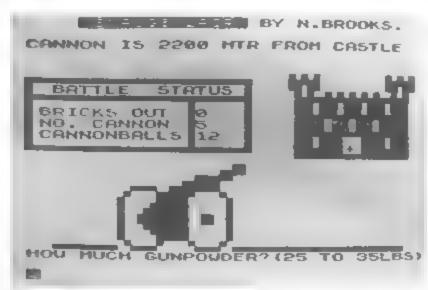
cann in to be set to (0 to 89 degrees)

The more garpowder you use the faster the cannonball eaves the cannon and hence the further the cannonball will fy. Some arry the angle of elevation affects the range. I have used Newton's formulae for the motion of projectiles from my out. A leve maths notes for this part of the program and have consulted backs on cannons for details of range and charge to make the scientific aspects of the program as accurate as possible.

A graphical display of the cannon being adjusted to the angle chosen is shown next, make no apply for the sowness of this part of the program as I wanted to introduce the concept of angles to my young family Adding tines 2205 FAST and 2910 SLOW will alleviate any boredom.

Into battle

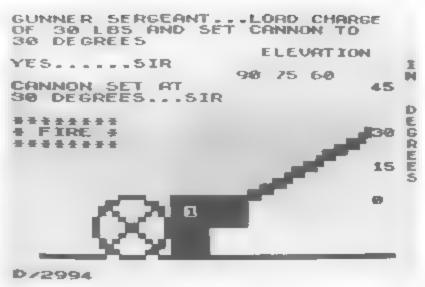
The main action comes on the 'Battlefield' screen which follows on from the previous screen automatically. The can non is displayed at the computer selected idistance from the castle and the can nonballis fired. Every fifth plot of the cannonbal, the dragon flies for the castle Unbeknown to the player if has chosen at random whether to attack the cannon or the caphonbal if the drauon chooses the cannon there is a 50% chance of a hit if the cannonbal is selected, then the odds of a hit are only 20%



The battle status screen at the start of play

Should the cannonball reach its farget, the castle is 400 metres high the the Vica ordinate of the carrianhal prodeterm ties how many brocks are knocked out if See programines 1071 to 1079. When in hight the dragon may obscure the ball

but tiw llarways relappear in the same position after the dragon has passed unless of course it buins the carnon be to a cinder. You are finally asked fixed wish the cintrole the gaine. Asswering no iN puls you in retreat and the



The display showing the cannon set to a chosen angle



The battlefield display with the cannonball fired and the dragon in flight

dragon wins

At the end of the game either with 6,000 bricks out of the castie or no cannon cannonbals lieft) there is an appropriate just reishow to watch which I leave you to discover.

The odds sightly favour the Gunner Captain once an appreciation of charge and angle has been gained. Bear in mind that an angle of 45 degrees will send the ball the maximum distance for any choice of

charge set at which, the casife is seldom damaged incidentally indian angle of say 60 degrees will result in the same final range as that of 30 degrees is each 15 degrees either side of 45 degrees. However, the castle presents a smaller target when dropped on from above rather than hit broads do on so for a more difficult game try a ways chosing angles over 45 degrees. have yet to windown damaged in sides.

Variables on a theme

he

S

d 10

11h

ue

L.

he

Listed here are the main variables used throughout the game.

BR C The number of bricks knocked out of the castle 6 000 bricks knocked out will win the game for BALL The number of cannonbal's remaining izero cannon bals left will result in you losing the game. GUNS The number of cannon you have reinalning izero can non-left will result in your bsing the game). ROJI The I give up code M The distance between the cannon and the castle The random number used to generate the variable, N G f G is equal to one, the dragon attacks the cannon ba only X and Y The colordinates of the cannonball Д The input for the angle of the cannon in radians В The angle converted into radians The input for the amount in bsi of junpowder

Other variables are used but they only exist to aid the running of the program.

```
10 REM "SMAUGS LAIR"
12 PRINT TAB 4," BMAUGE CAIR
  H. ERODKS.
  14
     PRINT
     PRINT "DO YOU WANT INSTRUCT
  16
IONS?
      (Y / N) "
        INKEYS "" THEN GOTO
     IF
 18
        ESTINKEYS
  20
     LET
     IF
  22
                 THEN GOSUB 9000
     LET BRIC-0
  50
  60
     LET
          GUNS=5
     LET
  70
         BALL=12
  15
     LET
         ROUT-0
  80
     CL 5
  90
     RAND
     LET N=INT (RND +
LET H-N+100+500
 150
                 (RND +19)
200
     LET G=8
210
 225
     GOSUB 8000
J40
     INPUT A
 350
     IF A>89 THEN GOTO 8950
 100
     G05UB 2000
440
     REM **HAIN PROGRAM**
450
     CLS
480
     PRINT TAB 4," ENGLISE LAIS
  N. BROOKS.
500
     LET 6-A+PI/160
     PRINT
650
            AT.
               15,27;
                       1
560
     PRINT
                           4.0
            AT
                16,27,
665
     PRINT
                17,27,
            BIL
670
     PRINT
            RT
                18,27,
     PRINT
580
            RT
                19,27
690 PRINT
            AT
                20,2,
```

```
700
710
720
        PRINT AT 19,20-N, "OF"
GOSUB 6000
        LET
               X1-0
  130
         LET
                Y1 -0
        FOR X=100 TO M+400 STEP 100
LET Y-(X*TAN B) (X++2/(U+20
  750
  550
 *+COS 6±COS B))
  360
        IF Y < = 0 AND X < M THEN GOTO
្នាក្
 . 65
         IF Y (-0 AND X)=M+150 THEN G
       1.050
        PLOT (X/50) +43 2±N, (Y/50) +5
IF X1>0 THEN UNPLOT (X1/50)
  370
       PLOI
  390
133
       (2*N), (Y1/50)+5
IF X/250-INT (X/250) AND X
  110
  J THEN GOSUB 3000
        LET X1
LET Y1
  130
             X) -M AND X (M+150) AND Y
         ΙF
1380
  NEW NEXT X
USØ PRINT AT 12,5,"*CANNONBALL
JERSHOT*"
         THEN GOTO 1070
 4 3 3
1020
. 350
1060 GOTO 1120
1070 PRINT AT 16,25; "##HIT##"; AT
15,25, "####### 17,25, "#####
1071
        IF Y <=400 AND Y>350 THEN LE
1871 IF Y = 400 AND Y > 350 THEN LE

1 BRIC = 6RIC + 1500

1072 IF Y < 350 AND Y > 300 THEN LE

1 BRIC - 8RIC + 1000

1074 IF Y ( - 300 AND Y > 200 THEN LE

1 BRIC - BRIC + 750

1076 IF Y < - 200 AND Y > 100 THEN LE

1 BRIC - BRIC + 500

1078 IF Y < - 100 THEN LET BRIC - 6RIC
 +250
1079 PRINT AT 12.2. "*BAL
", INT (Y), " METRES UP*"
1080 GOTO 1120
1100 PRINT AT 12,6; "*CAN
                        12,2." *BALL STRUCK
                        12,6; "*CANNONBALL
 "* TROPL
1120 LET BALL BALL 1
1125 PRINT AT 21.0, "DO YOU WANT
              INKEY$="" THEN GOTO 1127
INKEY$="N" THEN LET ROUT
1127 IF
  135
. .45
        COTO 80
  000
        REM ##ADJUST CANNON##
2020
        CLS
                   "GUNNER SERGEANT...LO
OF ",U," LBS AND SET
",A, DEGREES"
 050
        PRINT
     CHARGE
350
 CANNON
              TO
-070
        GOSUB
                   2992
208B
        PRINT
                  "YES....SIR"
3100
        PRINT
  150
        PRINT
        PRINT
  160
                   AT
                         17,6,"
165
                         17,13,6-GUNS
18,6,"
        PRINT
                   AT
1170
        PRINT
                   AT
2180
                        19,6,"
20,6;"
21,2,"
        PRINT
                   BT
2190
        PRINT
                   AT.
 200
        PRINT
                        21,2,
                   AT
202
210
                   2992
        GOSUB
        GOSUB
                   5000
0.220
        IF A)45 THEN GOTO 2650
FOR X=1 TO 20
LET Y-X+TAN (A, 160+PI)
2270
2280
        UNPLOT (X+35),11
UNPLOT (X+35),10
5350
                OT (X+35),10
(X+35),(Y+11)
(X+35),(Y+10)
  330
 350
        PLOT
2350
2550
        PLOT
        NEXT
                X
        GOTO 2910
 500
'550
        LET
              A-90 A
        FOR
  700
               Y=1 10 20
               X=Y*TAN (A/180*PI)
OT (Y+35),11
720
        LET
        UNPLOT
7760
                     (Y+35),10
        UNPLOT
```

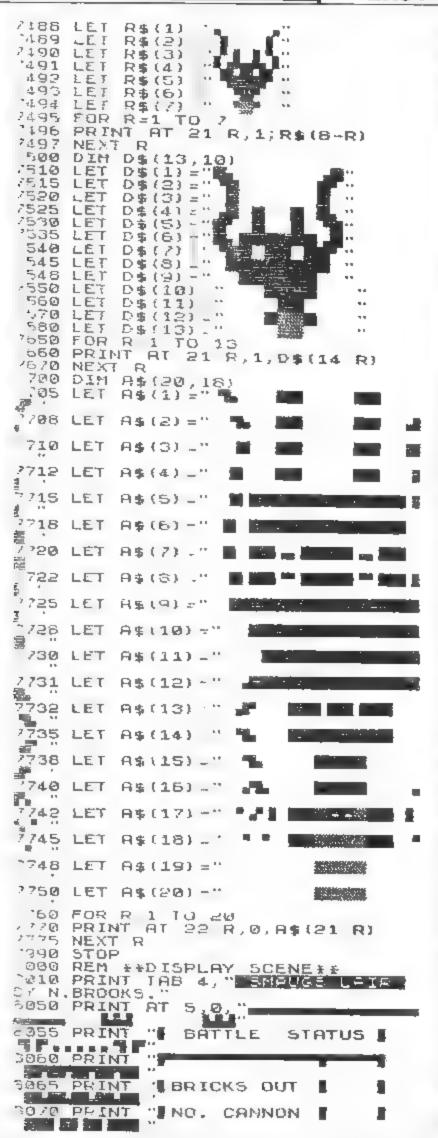
ZX81 CAME

```
780
                       X+35,7+11
                                                                                5500
                                                                                            RETURN
  700 PLOT X+36,Y+11
                                                                                6000 REM ##FIRE##
6050 LET A#-" BOOM"
5050 LET B#-" "
  850
           NE XT
           LET A 90-A
2300
                                                                                            FOR R.1 TO S
PRINT AT 19,21-N+R, A$(R)
                          2992
  920
           GOSUB
                                                                                C 100
           PRINT AT 6,0, "CANNON SET AT
                                                                                150
-930
                                                                                           NEXT
                                                                                                       R
           PRINT A, " DEGREES...SIR"
                                                                                           FOR R-1 TO 5
PRINT_AT 19,21-N+R,8$
  940
                                                                                L250
945
           PRINT
                                                                                € 300
 950
                                                                                            NEXT R
           GOSUB 2992
                                                                                5350
                         1965
           PRINT
                                                                                6500
1970
           PRINT
                                                                                            REM #CANNON DESTROYED#
LET GUNS=GUNS-1
PRINT AT 21,0,"*SMAUG HRS D
                                                                                5500
                         " # E E E E F F E E."
2375
           PRINT
                                                                               felo LET
  380
           G05UB 2992
                                                                                5620
   190
           RETURN
                                                                               SSTROYED THE CANNON *"
          FOR R-1 TO 25
NEXT R
RETURN
                                                                                          LET G-1
  992
                                                                               6630
6650
                                                                                                     G = 2
 1994
                                                                                1710 PRINT AT 12,0," #5MAUG HAS B
 996
 .000 REM ##FLY DRAGON##
                                                                                5710
 1020
                                                                                TRIST
            IF G-1 THEN LET 0=1
IF O 0 THEN LET P N+4+INT (
 1030 IF
                                                                                5720
                                                                                            GOTO 1125
 750
                                                                                 1200
                                                                                            REM #WIN/LOSE ROUTINES#
-ND #4)
                                                                                            PRINT AT 14,19, "BESTHEN HAND
                                                                                 1100
060 IF 0=1 THEN LET P=25-INT (X/50)+43 (2*N))/2)+INT (RND*5-2070 IF P<0 THEN LET P=INT (RN
                                                         (RND *5)
                                                                                   110 PRINT AT 15,19, "THE CASTLE
                                                               (RND #
                                                                                15
                                                                                 /120 PRINT AT 16,19, "DESTROYED R
           IF P>24 THEN LET P=24-INT (
 1080
                                                                                 130
RND *43
                                                                                                                 17,20,"SHAUG MUST'
18,20,"SEEK A NEW"
19,21,"WORMHOLE,"
1100 FOR R-1 TO 5
1100 PRINT AT 15-R,26," ""
120 PRINT AT 15-R,26;" "
130 PLOT (K/50)+43 2+N,(Y/50)+5
                                                                                            PRINT
                                                                                                          BT
                                                                                 140 PRINT AT
                                                                                                                 18,21, "WU
19,21, "WU
TO 2 STEP
                                                                                 7150
                                                                                            PRINT
                                                                                                          AT.
                                                                                  200
                                                                                            FOR R-11
                                                                                                                 R,24."
                                                                                            PRINT AT
                                                                                   210
3140
                      R
           NEXT
                                                                                 ,350
 150
           FUR R 1 TO 4
PRINT RT 10 R,26,""
PRINT RT 9 R,25,""
PRINT RT 10-R,26;"
PRINT RT 9-R,25;"
PRINT RT 9-R,25;"
PLOT (X/50)+43-2*N,(Y/50)+5
                                                                                 7230
                                                                                            NEXT
                                                                                                        R
          PRINT
   160
                                                                                            FOR R=24 TO 2 STEP 1
PRINT AT 2,R," ""
PRINT AT 2,R," "
                                                                                 2240
3170
  180
          PRINT
                                                                                 260 PRINT
  190
                                                                                                       R
          PLOT
  200
                                                                                290 IF RC-16 THEN
 3500 NEXT R
                               R(=16 THEN PRINT AT 2,R.
                                                                                "4
1000
          FOR 0-26
          PRINT AT
1020
                                                                               -95 IF RY16 THEN PPINT AT 2,R,"
4030
           PRINT
                          AT
1040
           PRINT
                                                                               300 PRINT
305 NEXT N
340 STOP
                          RT
                                                                                                          AT 2,R,"
1060 PRINT
                          AT
                                                                                            NEXT R
1070
           PRINT
                          AT
1280
          PRINT
                                                                                           PRINT AT 13,20, "SMAUG DINE
IF GUNS 0 THEN GOTO 7410
IF ROUT 1 THEN GOTO 7400
PRINT AT 14,18. "YOU ARE OUT
                          AT
                                                                                 / '50 PRINT
1090
           PRINT
                          AT.
                                                                                  3.20
:120
          PRINT
                          AT
                                                                                  580
490
4140 PRINT
                          AT
                                 3,6+3,
 - 160
          PRINT
                                                                                  OF "
                          AT
1180 PRINT AT 2,0-2," 1200 PRINT AT 2,0+3;" "1240 PRINT AT 1,0 2," 1250 PRINT AT 1,0+3," "1250 PRINT AT 1,0+3," "1
                                                                                   395 PRINT AT 15,19, CANNONBALLS
                                                            •
                                                                                2398 GOTO 7440
7400 PRINT RT 14,18, "YOU ARE BER
1799
          PLOT
                        (X/50) +43 -2 +N. (Y/50) +5
                                                                               TENT
4300 NEXT @
                                                                                7405 PRINT AT 15,18, "AND IN RETR
4 350
          FOR R-7
1,50 FOR R-7 TO 19
1400 PRINT AT R,0+1,"#"
1,50 PRINT AT R,0+1,"#"
                                                                                7498
                                                                                7498 GOTO 7440
7410 PRINT AT 14,18,"ALL THE CAN
1460
          NEXT R
                                                                                 "NON
1500
           IF
                  G=@ AND
                                                                                7420 PRINT AT 15,18; "ARE DESTROY
                                      (0+1 21-N DR 0+1
20 N) THEN GOSUB 6600
1000 IF 0+1 INT (((X/50)+43-(2+N
                                                                                εD.
                                                                                 7440 PRINT AT
                                                                                                                  17,18," *********
             THEN GOTO 5700
1) /2}
                                                                                 * * * "
450 PRINT AT
4760 FOR R 1 TO 7
4800 PRINT AT R,0-1,"
1910 PLOT (X/50) +43-2*N.(Y/50) +5
4820 NEXT R
                                                                                                                  18,18,"* FLEE FOR
                                                                                      4
                                                                                 7460 PRINT ST 19,18,"* YOUR LIVE
1990
           RETURN
                                                                                 7470 PRINT AT 20,18, "############
           REM ** HANGLE OF TRAGECTORY **
FOR R-0 TO 2
PRINT AT 16-R*3,28, R*15
េច១២
                                                                                 ** * * "
                                                                                                                 11,24,"""
11,24,"""
10 17 STEP -1
12,R,"""
                                                                                            PRINT
 .250
                                                                                 74.72
                                                                                                          AT
3100
                                                                                 7473
                                                                                            PRINT
                                                                                                          AT
          NEXT R
PRINT AT 6,28,45
FOR R-0 TO 2
PRINT AT 5,16+(7-R*3);60+R*
                                                                                7474
5200
                                                                                            FOR R
                                                                                                          24
5250
                                                                                 7475
                                                                                            PRINT
                                                                                                         AT
3300
                                                                                 7476
                                                                                            PRINT
                                                                                                          AT
                                                                                 7477
                                                                                            NEXT
                                                                                            PRINT AT
                                                                                 7478
                                                                                                                  11,24,0
3400 NEXT R

3420 PRINT RT 3,19, "ELEVATION"

3440 LET R$="IN DEGREES"

3460 FOR R=1 TO 11
                                                                                 7479
                                                                                 '480
                                                                                            FOR R 1 TO 8
                                                                                            PRINT AT 12+R, 17-2*R, " 4"
PRINT AT 12+R, 17-2*R, " "
                                                                                7402
                                                                                7484
            PRINT AT 3+R,31,R$(R)
                                                                                7486
 14 20
                                                                                            NEXT
                                                                                                        R
                                                                                 7487
5480 NEXT R
                                                                                            DIM R$ (7,5)
```



D

B

III

R

Я

R

B

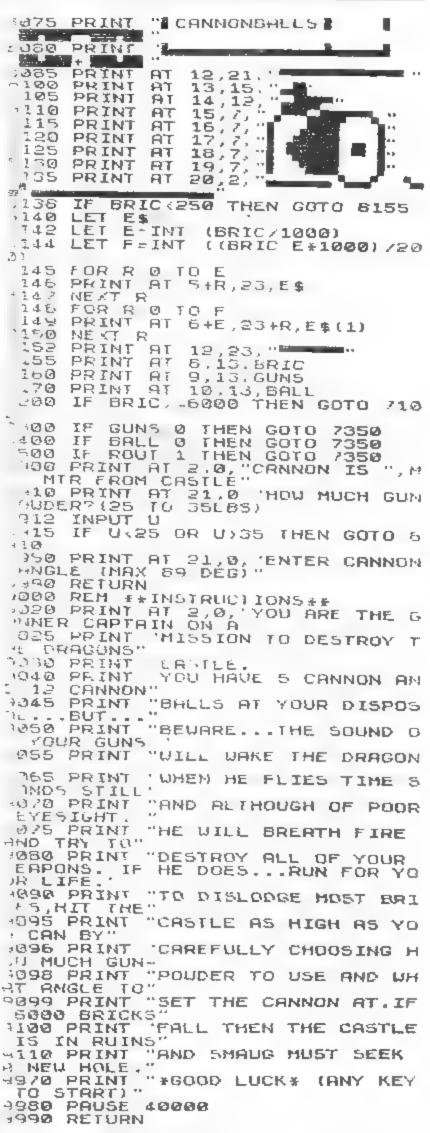
11.

+

R

E

*



The soft touch

The latest releases for the ZX Spectrum — James Walsh gives us his opinions!

Invasion Of The **Body Snatchers** — Crystal Computing

Contrary to expectation, there have been very few implement tations of the popular arcade game Defender for the Spectrum This has had little to do with the actual marketability of the game as can be seen from the quality of sales made on those available. This lack of competition has been to the disadvantage of the games

Till now with the introduction of the invasion of the Body Snatchers, from Crystal "I O B S ' which is a full mplementation of the arcade game includes a ful radar. Hall of Fame etc. Obviously few points can be awarded for originality but on the other hand it is the quality of the implementation which puts it so far above the rest. The explosions especially those of yourself are graphically fansee the original tastic Movement of yoursef the enemy and the bodies is not

and fast, very fast

As more and more aliens materialize on the screen the whole game gets frantic in deed. All the normal functions are available forward. reverse, fire and smart bombs Firing is not auto repet tive which makes the game more difficult still Scoring is on screen, with bonuses added for the number of bodies left after each wave of attackers f of course you manage to score one of the top scores you can enter your name for message, on the Hall of Fame

Sound on the Spectrum could hardly do justice to such an impressive program, so Crysta have opted to support the Fuller Music Box only. This s rather awkward for those who do not own one but another sacrifice which would have to be made when using the Spectrum's own sound is that of speed. The Spectrum does not allow you to send a sound to the noise circuitry and at tiget on with the production whilst you get on with the rest of the program the Fuller Box does hence allow ng the game to ren faster. Not surprisingly the sound effects

produced are very good, a credit to both Crystal and Fuller

As often is the case, ife is made a great dea easier with the use of a loystick, and this game is no exception. Fast and precise actions are the name of the game, a very enjoyable and add of veigame. Highly recom-

Transam Utlimate

Transam is one of the latest offerings from Ultimate originators of Pet Pac and Pssst Transam follows the tradition of quality graphics and simple but relatively original aims. The scenario lit s the year 3472 and all that remains on Earth are remnants of a once great continent a barren and your aim in the Super Brown Red Racer equipped with advance technology is to regain the eight trophies from the Deadly Black Turbos

The scenario is corny but what to the game itself? You have four car controls either ava able from the keyboard or via a joystick. They are anticlockwise rotate, clockwise rotate, brake and accelerator. There is also Pause, temporarry to halt the game. The actual aim of the game in plan English this time is to travel over America. searching for the eight. Great Cups of Ultimate Along the way t wil be necessary to keep filled up with petro I do not worry there are petropumps in this desolate place of sand, rocks and boulders! Various objects will appear in your patch and, of course, the Deadly Black Turbos' will attempt to make you crash

The display is 20 with your car starting in the centre of the screen rotating and with the barren land, etc, moving past On the left hand side of the screen is a 'Real Time Clock e one that can tel the real time continuous y milometer a complete map of the USA showing the positions of fuel pumps icities etc, and you the Red Racer, as a flashing character. Moving down to the second half of this display is a speedometer fue. guage and temperature gauge There is also a short range radar, showing the positions of cups and the Black Turbos Finally the number of cups found and the number of lives

The graphics are smooth fast and of a high quality ust ike the other Ut mate games This in some respects is one of my man quams about Transam it sivery Ultimate in that no new boundaries have been crossed or new ideas used. The game is very professionally written with only one minor bug the fact that when you reach the boundaries of the U.S. your car is simply flipped round without notice, which can cause problems if a Black Turbo is in close pursuit Overall, Transam s fun though less original than of mate's previous two. The presentation is excellent add ct ve. and we recommended

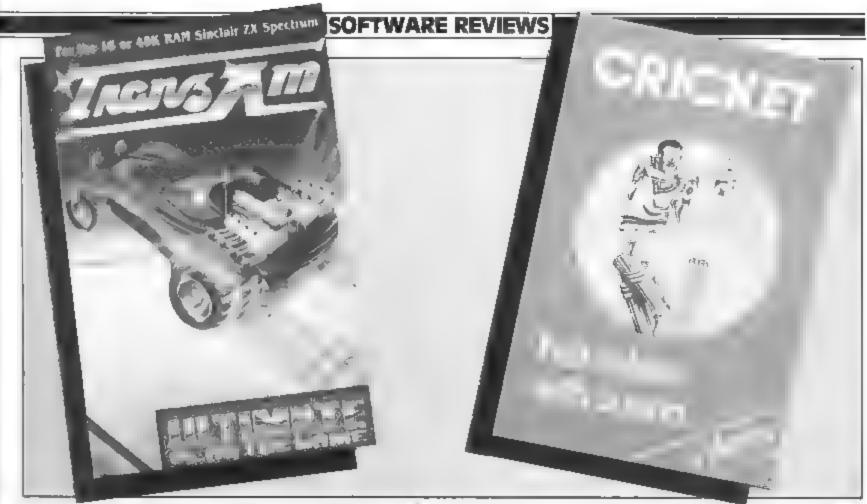


Cricket from Cambridge Microcomputer Centre comes complete with a B side Darts (computing really is getting like show biz) Both games are BASIC in language and in playing

The screen is set up with two wickets and 13 men on







display Each man takes up a single character square, hence the graphic definition is far from wonderfu. Before each ball is bowied, the speed must be entered as slow medium or fast. The ball is shown trave I ng towards the batsman and then away again. You may control the man nearest the ball to try and stop or catch it This I found to be a lot harder than expected. A full scorecard and information board is continuously updated and available. Sound effects are existant but rather basic and not surprisingly for the Spectrum, unrealistic

past the ock rea ap of the ities or as by ng

fue

uge

ange

ns of

bos

Cups

IVES

oth

nate

cts

alms

very

new

sed

ame

tten

ach

/Our

ınd

can

lack

LP.

han

The

int

re

çe.

185

rts

ike

e e

n

ith

QP.

184

Unfortunately there is little skill required on the part of the player and little incentive from a novel but rather unexciting came.

Darts is very much a Biside You pick a target, the computer throws and hits randomly at that area. Hence no skill to required. No more need to be said about this or the game cassette as a whole

Maxiaca — dK'tronics

Yes, Maziacs is a maze game as the title suggests, but it is not a copy of Pacman' (sigh of relief). dK tronics who have produced other quality products, have done one large step forward from Pacman.

To start the maze is bigger in fact it has no edges, but

hundreds of ocations Only about one fit eth of the total maze is normally shown on the screen with a full one twe fith being disprayed by the pressing of the appropriate key. A totally new maze is generated on each go so making for a very varied game.

Dotted all over the maze are swords, prisoners and a pile of treasure all set into the walls until you collect them. Only one sword may be held at a time and just one Maziac can be killed with it. A Maziac significant sword in the sword in

horrible monster that has a tendency to attack you. There are an enormous number of Maziacs milling around all over the maze if you are sitting down, they will attack and kill If you are walking without a sword, then you are more than ikely going to be killed. On the other hand if you are walking without a sword, the Maziac will die One of the nicest little things about Maziacs is the fearful fights which they will put up. The aim of the game is to find the freasure. This is not

ar easy ob when you are in a maze of such size Fortunately, the prisoners will light the way for a short distance. Once the trasure is found getting it back is far from easy as a sword may not be carried so the treasure must be dropped before conflict.

On the right hand edge of the screen is an energy level indicator which can drop very rapidly at times. If it gets to zero you die. To keep energy up it is necessary to eat food also found in the walls.

Maziacs is one of the most exciting games I have played for a while. The graphics are very good, they are smooth and fast. With three evels of play it will be a ong time before the game becomes too easy.

A great game and highly recommended

Terror-Daktil — Melbourne House

Me'bourne House have a string of excellent titles to their name. The Hobbit probably being the most we known just from the cover this coks as if it could be a winner.

On oading, a stunning introscreen is displayed an outline version of the cover, in fact. Once the whole game has loaded the screen just stands at it and gives no indication that it has successfully loaded



ZX COMPUTING DECEMBER 1983, JANUARY 1984

By pressing a key the next display is shown with the top scores in the middle. By pressing another key the game begins liftleft for thirty seconds it will enter a limited demologisting.

Now the introductory program begins Because it is relatively long and merely an introllit can be missed by pressing the appropriate key During this routine the display becomes the window of an aeroplane flying through the clouds Then, as trouble starts it is possible to see the volcances over which you are flying Finally, after attempts at anding have failed, your plane crashes. Next day you awake to see Terror Daktils.

flying in the distance There are three cannons in a nearby valey You drag a cannon over and prepare for the onslaught. In the distance, the Terror Dakt Is look like space hvaders moving from left to right and back again in a jerky manner As they individually fly at you they may be destroyed by a direct hit from the cannon far more easily said than done if you survive the first wave of Daktils then night falls and day breaks for the next day. If you survive six days a rescue plane will arrive. The Dakt is have an affinity for landing on you hence stunning you till

the next day and damaging the cannon beyond repair

The graph cs are quita superbithough jerky at times. The sound is good, though rather overdone at times. Terror Dakt is a fast highly addictive and a difficult game to master. The quality of the program itself is up to the best around the Spectrum it may be thought of as too hard, hence not recommended for most young children.

Me bourne House have succeeded in continuing their tradition with another excellent game.

Luna Crabs — Micromega

You have been sent to one of Saturn's moons to gather data and samples of minerals much needed on the planet Earth. A simple and routine exercise until the bio sensor detects creatures following you Suddenly they start to spit deadly acid balls. You have no alternative but to stop and fight. One caterpillar track on your land craw er has been hit so you may rotate left or right and fire.

The game is in 3D. The screen shows the latest view from inside your crawler. The turret of your gun is shown at the bottom of the screen.

this is hit you die As the crawler rotates the display moves none direction or the other When firing your photon bolt it may be guided to hit one of the rather ferodous Luna Crabs

Technically the game is good fine movement though rather jerky in the case of the crabs themselves. The overall graphics are pleasant and enjoyable to look at it is fast whilst still being relatively easy even for the novice Micromega have followed a very admirable policy of showing screen photos of the game on the cassette in ay so as to give you, the potential customer a better dea of the game before buying. On the whole the game is surprisingly easy to hand e, though still a challenge after playing a while

Though it is not up to the top professional standard of such companies as Ultimate Crystal, etc. It is an enjoyable and surprisingly additive game to play

Championship Darts — Shadow Software

Darts is not a game readly associated with computer simulation, hance titakes just that bit extra to design and

market a version which competes with the more computer orientated games Have Shadow Software managed this?

On loading a reasonably good introductory 'screen' is displayed a good start. To play the game itself a standard board is displayed on the screen, with a line from the centre of the board to the circumference rotating around the centre it is then up to your judegement as to stopping the ine over the desired value Once the ne has been stopped another display comes nto use A small blob runs backwards and forwards along a line with double, treble off the board and 25 shown on t By pressing a key at the right moment the desired type s selected, with this your score is determined and substracted from the start value Obviously there s provision for two players but not for the computer to play The graphics though not complicated, are quite pleasant, but nothing amazing Instructions are limited giving just about enough to go on but realy they should have been rather more comprehen SIVE

In conclusion it can be said that Championship Darts is nicely put together quite fun to play but technically limited by a relatively average program

Cyberzone — Crystal Computing

Crysta seem, continously, to be switching between adventure and arcade style games. One of their first games, Merchant of Venus. was an adventure/trader type game but with moving graphics Cosmic Guerika sian arcade game. Dungeon Master is an adventure, whilst Halls of the Things is an arcade game but with an adventure type scenario. Cyberzone is a pure arcade game. Jn. ke Return of the Body Snatchers it is not an actual copy of a true arcade game but rather a mix up of many different games

At the top of the screen is a little green man enclosed in a space iship with a revolving floor. By firing at the space ship's floor it will slowly but surely disintegrate. Once it has, to a arge enough extentithen you must shoot the alien's eff foot.

There must be some hidden meaning behind this!



Fortunately, the game is not quite that easy. Whilst your base runs along the bottom of the screen, the alien ship also has its own laser running along tabase. This will fire on all but the lowest of the fre levels Often a little fighter aircraft will be sent out by the aken These swoop their way across and down the screen, occasionally dropping bombs, which must be avoided at all costs If a fighter aircraft is hit t will spin over and dive towards the earth. From time to time, the alien ship will drop a scanner ship into the battle. You cannot shoot them, but the fighter aircraft can be enticed into hitting them as can the alien ship's own gun These scanner shops do not fire at you, but rather at whatever you fire, hence bocking your fire untidestroyed or retrieved by the alien ship

չի շի

more

ames

ware

nab v

an is

rt. To

ndard

the

n the

the

round

your g the

ralue

been

play

blob

vards

elde

าดพก

it the

type

VOLU

and

start

e 5

but :

piay

na1

u te zing

iving

on

have

hen

said

\$ 5

։ (Ար

rited

pro

, to

een

tyle frst

nus

ype ng

s an

ster

5 of

ame

ype

Dure

n of

t an

ade

a f

is a

n a

ring

ace

but

ıt

ent,

the

den

IS!

984

PITMAN 7 — Visions Software Factory

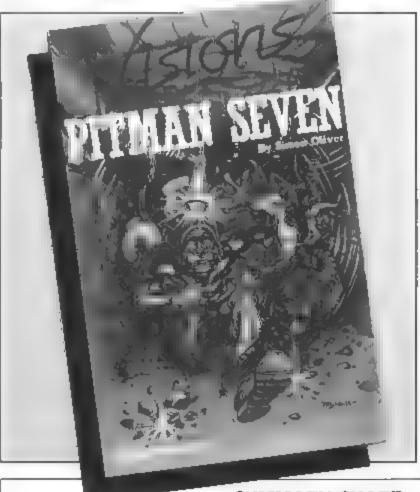
Pitman 7 is a new game a recently formed company. V sions

Two teams of seven men are trapped on the tifth level of an underground mine. Your task is to quide each one to the surface through the many tunne's and shafts. Just to make things a the more interesting rocks are castading towards you at a frightening velocity There are a number of ways to avoid these to employer them, go through a hatchway onto another level or jump and hang on to ball above parts of the tunnes if this is not enough it is then necessary to guide the other team though funne's litting with a positious ges. Gas suits are avialable but getting them can be a problem.

Though the scenar olmay be different the screen display and basics of the game are the same as Donkey Konglett Fortunately a number of additions have been made to make thratter more varied and exciting game than Donkey Konglitself. The quality of graphics is quite good, though a little jerky and not as detailed as some of the other games. I have seen

n many ways it comes as an advanced version of Donkey Kong which will appeal to Donkey Kong addicts but with a new story line which gives is new life.

Pitman Seven must rate as one of the better copies of arcade games. Fortunately the extended scenario puts it.



right, and a very good one at that!

* Stop Press *

Late news from Crystal Computing They are to aunch a new game called Rommel's Revenge So what I hear you say Romme s Revenge is a 'Battle Zone copy to beat all arcade game copies. As yet I have only seen a preproduction version, but with stunning 3D graphics blocks, pyramids, continously rotating radar towers tanks, as well as space ships and rotationally scanning radar, we are talking about a very special piece of software. It will be blasting its way on to the market during November Watch this space for a full review in the next

Two editions ago I reviewed Dungeon Master by Crystal it came out very well. Since then vast improvements have been made with the addition of a number of machine code routines and new facilities.

SUMMARY CHART

Names	, see	der designed	Contractor Sec.	Section Organic	A Profes	STATE OF STA	Sec Parks
Maziacs	48	4	4	4	4	4	4
Transam	16	4	31,	3 %	3 1/2	3 1/2	3/2
Championsh p Darts	16	3	3	3	3	2 1/2	3
Pitman 7	48	3 1/2	4 %2	3 2	3 %	4	4
Terror Dakt	48	4 1/2	4 2	4 /2	4 /2	4 1/2	4 1/2
cuna Crabs	16	4 1/2	4 /2	4	4	4	4 1/2
nvasion of the Body Snatchers	48	4	5	4 1/2	4 1/2	4 1/2	4 2
	4.0	A	3	2 1/2	3	3	3
Cricket	48	4	J	2 72	,	1,4	

Addresses

Cambridge Microcomputer Centre 153.4 East Road, Cambridge

Ultimate The Green Ashby de la Zouch Leidestershire LE6

Visions Software Factory) Ltd, 1 Feigate Mews Studland Street, London W6 9JT

dK tronics Ltd. Shire Hill industrial Estate. Saffron Walden,

Melbourne House 131 Trafalgar Road London SE10 Micromega 230 236 Lavender Hill, London SW11 1LE Crystal Computing 2 Ashton Way Fast Herrington Sunderland SR3 3RX

Shadow Software, 8 Hargate, Thurnscop in Rotherham S Yorkshire \$63 OTU

Block deletion

A useful utility for the Spectrum, courtesy of Rodney Francis of Essex.



This program in machine code with a BASIC starter has been written to provide a very fast method of deleting a block of BASIC program it saves all the tediousness of deleting one line at a time.

The machine code is relocatable anywhere above RAMtop but for demonstration purposes it starts a address 32000 7000 Hex. It is relocated the astine of the BASIC program must be a tered accordingly.

The BASIC program which has been deliberately numbered to be at the erid of your own program and is called by a GO TO 9992 command starts by asking for the imiting ine numbers. These are checked for obvious inconsistencies, and are then POKED into a temporary store in the printer buffer for use by the

machine code rout to. The machine code routine is then run. At that show necessary sito delete the first the number of the block in the normal way.

Care should be taken to ensure that both the first and last nehumbers actually exist in the program of the first ine does not exist the result will liet be too disastrous but you will have to delete the next existing ine number in the normal way to complete the deletion. However increated would be entering a last ine winth does not exist because the resulting deletion would include the next existing line to awang the line entered.

Tile BASIC starter is shown if Fig. 1. The imperior cs and description of the machine code routine are shown in Fig. 2.

3991 STOP 3992 INPUT "Enter first line no. ", line1 9993 INPUT "Enter last line no. ', line2 3994 IF line1; line2 OR line1(1 f R line2; 9999 THEN GO TO 9992 3995 POKE 23296, line1 256 & INT (1101/256)
3996 POKE 23297, INT (line1/256)
3997 POKE 23298, line2-256 * INT (1102/256)
4998 POKE 23299, INT (line2/256)
3999 RANDOMIZE USR 32000

Fig 1 The BASIC starter program.

id ht (23296) call 6510 Find the address of the first byte of the line length for the first, he to be deleted and put it on the nc h 1. H stack oush h ld h (23298) ca 6510 Find the address at the tirst cycle of the inellength nt h for the last line to be deleted. 136 1 lde h no hi Find the length of the last line and hence find the dd b address following the end of the last inciոլ հ add hl de pop de push de Recover the address of the first byte of the line ength of the first, me to be deleted and restore it अभिराह्म on the stack, then calculate the total in imber of sho blide dec bl bytes excluding the first four to be deleted dec hi ex de hi losert this number into the line length of the first pop h ld h e number to be deleted ac bl d third ret.

Fig 2. The mnemonics and description of the machine code routine

The deletion of the first ine causes the deletion of the whole block because the machine code routine has altered its the ength to notice all the following data which is to be removed. The computer now thinks that the

tirst line of the block extends to the end of the last line

To cater for both decimal and hexadecimal buffs, the machine code, string for both are given in Fig. 3.

	on this wat the		
32000 3000 3000 3000 3000 3000 3000 3000 3000 3000 3000 3000 3000 3000 30000 30	######################################	7000 7000 7000 7000 7000 7000 7000 700	

Fig. 3. The decimal and hexadecimal listing of the machine code listing.





Inside...
New Interface 2
and ROM cartridges!
New Software!

(1

pth

8

it t

n to

PROBLESS SASSOES

1933E363915702B6

10681332**9**

TAKING NEW SOFTWARE IN NEW DIRECTIONS

You see that this issue of Sinciair Special devotes considerable space to software Why, when we've so much to say about hardware and per pherais? Simply because at Sinciair we believe in supporting first class software.

This month sees the start of a new commitment to education in our catalogue, both for adults and children.

In the field of micro theory, we've programs like Beyond BASIC and Make-a Chip, which take you from the creation of simple ZX® assembler subsets to simulated circuit design projects.

There's Music master to teach you music terminology note values and composition

And if you re keen to beat your Spectrum at chess (which can be hard) you cartainly want to try Chess Tutor 1 the first program in a complete chess masterclass

Coming soon...

In the pipenne are many new releases, some of which break completely new ground LOGO and micro-PROLOG for instance. They re fifth generation languages which will take you and your Spectrum closer than ever before to the creation and application of artificial interagence.

A formal agreement between Sinclair and Macmillan Education has been announced the first results of which will be published this autumn. These consist of five programs in a complete early reading course plus the first four of a series of programs based on Macmillan's top selling Science Horizons. Scheme Aliprograms are designed for use in schools or the home.

And with Blackboard software, we're publishing six more home education programs for primary school children. Covering alphabet spelling and punctuation, each of these programs is a true gemilinitie any other education software, and fascinating to run. Even for adults.

believe that these new titles represent a major advance in educa tional software for the home

New ROM software too!

You may well have heard news of ZX Interface 2 st and ROM cartridge programs. You ill find full defalls of the interface and its software on the facing page (and there's an order form on the back page foor). These offer an instant games playing factify at unbeatable prices, and expand the possibilities of using your Spectrum in yet another direction.

Alison Magnire

Alison Maguire Appi cations Software Manager

SOFTWARE UPDATE

The latest cassette software for ZX® Computers®









Chess Tutor 1 For 48K RAM Spectrum £9.95.

Chess Tutor is a new way of earning all about chess using your ZX Spectrum **

It starts from the beginning by teaching you about the chess pieces and the way they move - including castling en passant, promotion, check, checkmate, stalemate and perpetual check.

Then it teaches you the basic tactics - pins. forks double attacks and skewers.

There are over 120 exercises and over 200 quest ons for you to answer—with demonstrations and hints from your ZX Spectrum when you want them

You can choose which parts of the course you want and even experienced players may be surprised at what they can learn from Chess Tutor

Musicmaster For 48K RAM Spectrum £9.95.

Musicmaster turns your ZX Spectrum into a musical instrument which will not only play tunes, but will a so demonstrate key signatures, durations of notes, and scales

You can write your own tunes - n any key play them over and over again, save them on tape modify them

You can either write your music on a stave, or place a simple overlay on your Spectrum for a 17-note keyboard

Make-a-Chip For 48K RAM Spectrum, \$9.95.

Make-a-Chip teaches you the basic elements of circuit design, shows you how they fit together, and then lets you design and test your own circuits.

When you have designed a circuit you can give it inputs and outputs and your ZX.

Spectrum will check it for you. Then it will run to rite—you what's wrong so that you can modify it.

Make-a-Chip is a fascinating way of finding out how computer logic works

Print Utilities For 16K and 48K RAM Spectrum £9.95.

ncrease the printing and display facilities of your ZX Spectrum with the Print Ut lities program

Print Utilities enables you to enhance your programs by generating characters of eight different sizes which you can place anywhere on your screen.

For 48K RAM-Spectrum. £9.95.

Takes the agony out of assembler. Takes the mystery out of machine code.

Beyond BASIC gives you a deeper neight into the workings of your ZX Spectrum It explains what happens inside your micro when you run a program and it teaches you simple 280 machine code programming

A major feature of Beyond BAS C is that it enables you to write your own Z80 assembles programs - then you can actually see on your screen how they affect the ZX Spectrum

ZX INTERFACE 2°

The New ROM Cartridge/Joystick Interface

Loads programs instantly! Takes two joysticks! Just plug-in and play!

ers

ut

ey

nd

ňs,

O

tra

nay

ires,

for

ts

The ZX Interface 2 is the latest new peripheral for the ZX Spectrum® system. It enables you to use new ZX® ROM cartridge software plug-in programs that load instantly. It allows you to use two standard joysticks, without the need for separate, special interfaces.

To use new ZX ROM cartridge programs, just connect Interface 2 to the rear of your Spectrum or Interface 1 and plug in the cartridge of your choice. The program is then loaded, ready to run!

You can use any joystick that has a 9-way Digituse one or two of them for extra fun with ZX ROM cartridge or Sinclair cassette programs – or with dozens of other Spectrum compatible programs!



..AND BRAND NEW ROM CARTRIDGE SOFTWARE!

There's already plenty of choice of ZX ROM cartridge programs for your Spectrum. Some are old favourities, in an exciting new form. Others are new

And now, thanks to ROM cartridge technology, you can run them all on a 16K RAM Spectrum, even if they were originally written only for 48K machines!

Every ROM cartridge program loads fast and faultessly No wires, no waiting, no worries about cading errors. All of them are affordably priced too, at £14.95.

Chess

Backgammon



Everything you need to play the famous and decep tively simple board game. Board, stones, rolling dice

and doubling dice are shown in full colour and high resolution Choose from four levels of skill to suit experts and beginners alike - full rules are included

Space Raiders



Your skills a that's stopping successive waves of allens from destroying Earth Use your gun base

Io aftack. Shelter behind buildings move out and blast the passing alien soaceship

Full-colour high resolution graphics with sound

New! PSS\$T



Robbie the Robot sits in his garden Help him fetch compost to cult vate his prize Thyrgodian Megga Chrysanthodil, Help

him make the right choice of pesticide to ward off devilish insects. Stop the insects breeding to overwhelming numbers before Robbie's plant has bloomed. PSSST is horticulture with a horrendous twist.

One and two player option with a host of features including sound effects

to s.



Dodge and swerve using your thrust button, turn on a planetoid fire But beware - the alienish pimoves

fast to destroy you with cluster bombs. And when it comes to the crunch, use your hyperspace button.

Full colour high resolution graphics with sound.

Hungry Horace



Horace is forever being chased around the park by guards

He steals their unch eats path

way flowers and creates chaos in the park by ringing the alarm!

You li have to be quick to keep Horace out of trouble!

Full colour high resolution graphics with sound

New! Tranz Am



Set in a future time ruled by cars and trophies, in a land where petrol replaces gold, and status is possession.

of the 8 Great Cups of Ultimate

Driving your Super Brown Red Racer use your skill to outwit and crash the Deadly Brack Turbos Use your instruments to ocate and collect the trophies before you overheat or run out of file.

A program with outstanding multi-directional movement, graph cleatures and a playing area equivalent to more than 200 times also programs.

Horace and the Spiders

The high resolution chass-

board and pieces are arranged

n a row and co Jmp system, so

At any stage of the game you

its easy to key in your moves.

can request the computer to

suggest a move reverse roles

Full colour high resolution

or change the level of skill



graphics

Guide Horace on the hazardous journey to the cobwebbed house full of poisonous spiders

This sophisticated

program does

everything you'd

expect at board

game eve and

much more besides.

Safe yin the house you must move along cobwebs choose a spot and umplonit! The spiders will be nighterary scuttling to repair their predicts web.

And when a spider is spinning a new section, you're safe to attack and destroy it

K ail the spiders and a new web appears with even more spiders to catch

Full colour high resolution

New! Cookie



You're Charlie the Chef who keeps his ingredients locked in the larger But if the ingreight dients escape they

bring the ined bie Nasties with

You must daze the escaping ngredients with flour bombs and knock them into the mixing bowl. Stop them getting into the dustbin at a costs! And beware of Nasties that get into the mixing bowl.

Cook e is fast moving panic in the pantry with a cast of rea characters. A program to make

New! Jet Pac



As Chief Test Prof of the Acme Interstellar Transport Company your task is to deliver and assemble spaceship

kits. On your way round the galaxy, you're free to collect precious stones and gold.

The catch? Rocket fuel is precious and scarce. And the aliens don't take kindly to the theft of their valuables. You need your wils and your asers.

With a host of features including multi-directional movement explosions, sound effects and one and two player option





NOW ON RELEASE

The ZX Microdrive System—as you'd expect from Sinclair—is unique to the world of computing. It's a compact expandable add-on system which provides high speed access to massive data storage. With just one Microdrive alone (and Interface 1), you'll have at least 85K bytes of storage, the ability to LOAD and SAVE in mere seconds, the begin nings of a local area network of up to 64 Spectrums, and a built-in RS232 interface! The cost? Less than £50 for each Microdrive.

How to get ZX Microdrive Spectrum owners who bought direct

from us, by mail order, have been

sent full details. Order forms are being mailed in strict rotation, so if you haven't yet received your order form please bear with us. We're making good progress in meeting the huge demand.

If you didn't buy your Spectrum by mail order, don't worry. Send us the form from the bottom of this page. We'll add your name to the maling list, and send you by return

The new ZX Microdrive System
Each Microdrive £49.95. Interface 1
costs £49.95, but just £29.95. f
purchased with a ZX Microdrive
Extra ZX Microdrive cartridges £4.95.

How to order

Simply fill in the relevant sections on the order form below. Note that there is no postage or packing to pay on some purchases. Orders may be sent FREEPOST (no stamp needed). Credit card holders may order by phone, calling 01-200 0200, 24 hours a day. 14-day money-back option, of course.

ZX ZX Spectrum ZX interface and ZX Microdrive are all registered trade marks of Sinclair Research Ltd.



Sinclair Research Ltd. Stanhope Road. Camberley. Surrey. GU15 3PS. Telephone: (0276) 685311

	air Research Ltd. FREEPOST Cambe	nak, surre	у, што ави.					ORDER FORM
Section	A Ha dware				CASSE	FTYE PROGRAMS for 2	X Spectrum	
			Item Price	Total	E 9//S	Chess fulget	4 308	9 45
Oty	Item	Code	<u>s</u> .	Σ	E 7.15	Miyskimas er	4306	9.95
	ZX nienace 2	850	19.95		£8/5	Beyond BASIC	4307	9.95
	Zk Specium 48k	3000	129.46		E6/8	Make a Chip	4306	9.95
	∠X Spertrym 16k	3002	명의 당시		L 5. S	Print Jit inties	4404	9.95
	Post age and packing	2029	4.95					2 JATOT
			TOTALE					
					* en lose a heque			
Section	B Software ROM CARTRIDGE PRO	GRAMS				Research Ltd for £		
364,001	G12 R Planeloids	5302	4 95			v Ac less Barriayrard	Trustcand accou	ባ ላው
	G9/R Space Raiders	5300	4.95		Delote complete applicable			
	6 3/R Hungry Horace	5303	4 95					
	G24/R Horace and the Spiders	5305	4 95		5 grature			
	G28 R PSSST	5307	4 95					
	G30/R Chokie	5309	4 95		Mr M J Mas			
	G29 R Tranz Am	5308	14 95		Address			
	G27 R let Pac	5306	14 95					
		5304						
	G22 R Backgammon		14.95					
	C10 R Chess	5301	14.95					. 9.2

ZX Microdrive information request

Please add my name to the Microdrive Mailing List, and send me a colour brochure with full specifications of ZX Microdrive, interface 1. (tick here). You can use the above form to send us your name and address.

Minefiel

Watch your step in this program by Stan Hatton of Pontefract.

All you have to do in this game. for your ZX81 is to establish a safe route through a minefield. you know to be planted with 13

To the death

Your mission is of the suicide. variety and of the utmost impordegree you was are expening on historic Good Lick

dable. You command three menand their task is to beat a path. through the minefield at least one of your men must get through as three explosions w alert the enemy that someone is trying to cross their defences and your mission will be over

You move your men across using the cursor keys. No clues rance I vital to the war effort I or hints are given as to where the in the war you have happened in hes have been hidden. You on And that is why to a certain must manoeuver your men pure

Line by line

at

may

200

ICK

eriev

MRC

Here follows a brie	f breakdown of the program, line by the
unes 5 35	Set up the variables used throughout the pro-
unes 40-55	gram Provide the geographical parameters of the
	minefield in which to confine the random
	deproyment of mines
Lines 60-75	The random deployment of the mines in the
	m nefie d
unes 80-120	The minefield screen display
unes 125 190	Control the movement of the men. Lines
	155, 170 compare the men's movements.
	with the 13 mine positions (
Lines 195 225	Control the end of the game and theire start if
	required
Lines 1000-1030	Contain the code for the word START to
	flash on the screen at the start of the game
LINES 2000-2080	Contain the routine for what happens, explo-
	signs letc, when one of your characters steps
	on one of the hidden mines
Lines 3000 3030	Contain the code for the word. HOME to flash
	on the screen when you have managed to

cross the minefield with one of your

characters.

```
:SET UP VARIABLES, ETC.
    REM
    RAND @
    DIH L (13)
DIM C (13)
LET L=21
  16
  20
  25
         C = 1
    LET
  30
    LET
         G=1
  35
    LET
         M=157
    LET
  40
         A=18
  45
         B=3
         D=31
  50
    LET
  55
    LET
    REM
         : SECRET RANDOM DEPLOYME
 OF MINES.
50 FOR N=1 'TO 13
         L(N) =INT
                    (RND # (A-B+1) +B
  65 L6T
  70 LET C(N) = INT (RND + (D-E+1) +E
  75 NEXT N
    REM : MINEFIELD SCREEN DISPL
AY.
               11,11, "MINEFIELD"
  90 PRINT RT
```

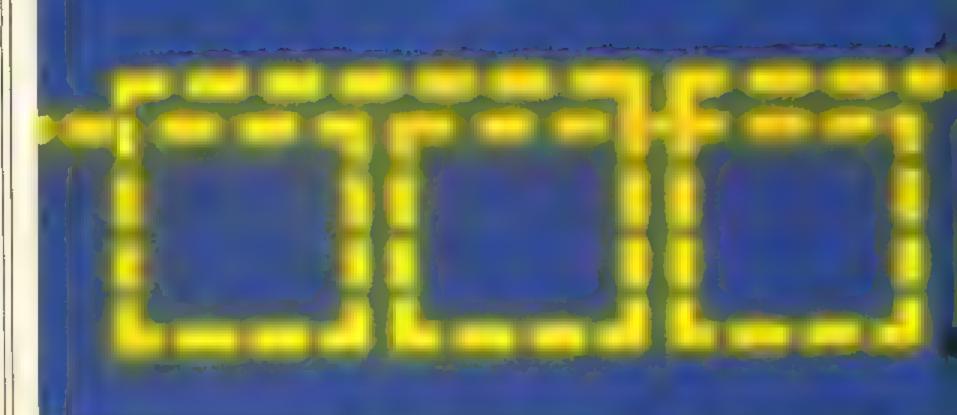
```
100 PRINT
              AT
                  21,21."N 8 8 5TART
             PRESS NEULINE TO RESTA
 104 REM
                     YOUR OWN PACE.
   PROGRAMME AT
      INPUT P$
GOSUB 1000
PRINT AT 21,21," ",AT 21,1,
 105
 110
CHR $
          | MOVE AND CONTROL |
| INKEY$="5" THEN LET
                                    MEN.
 125
                                     C=C-
          INKEY $= "6" THEN LET L=L+
 130
1
 135
      IF
           INKEY $= "?" THEN LET LaL-
1
 140
      IF
          INKEYS="B" THEN LET C=C+
 145
      IF L=1 AND C=30 THEN GOTO 1
95
 150
          M=0 THEN GOTS 195
 155
      FOR N=1 TO 13
      IF L=L(N) AND C=C(N)
 160
OSUB
      2000
      NEXT N
PRINT AT 21.1."
FOR T=1 TO 12'
NEXT T
 165
 170
 175
      PRINT
 160
 185
              AT L,C,CHR$ M
 190
      GOTO 125
             CLOSE OF GAME AND REST
 194
      REM
ART.
      FOR N=1 TO 13
PRINT AT L(N), C(N) "*'
 195
 300
 205
      NEXT
             N
      G05UB 3000
 210
 215
      STOP
      REM PRESS DUN PACE.
 215
            -PRESS CONT FOR ANOTHER
 GAME AT
 220
 225
       GOTO 5
 999
      REM
             G05U6 1000 'START" MAD
 TO
      FLASH FOR EFFECT.
      FOR N=1 TO 10
PRINT AT 21,27,
FOR T=1 TO 19
NEXT T
1000
1005
1010
      NEXT T
PRINT
NEXT N
RETURN
1015
              AT 21.22, "START"
1020
1025
1030
             GOSUB 2000 LHAT HAPPE"
1999
      REM
 WHEN YOU STEP ON H HINE.
5900
2005
      FAST
      NEXT
2010
2015
      SLOW
      PRINT AT 11,11," MAN DEAD"
FOR T=1 TO 50 ,
NEXT T
5052
5050
2030
         INT AT L(N),C(N),"*"
T M=M+1
M=150 THEN LET H=0
      PRINT
2035
      LET
2949
2041
      LET
2045
           8=G+1
           C(N)=21
2050
      LET
2055
      LET
2059
      REM
            PRESS NEWLINE AT YOUR
           TO CALL UP NEXT MAN.
OUN PACE
      INPUT P$
PRINT AT
PRINT AT
3060
      PRINT AT 11,11; "MINEFIELD"
PRINT AT 21, (21+6). "
PRINT AT 21,1, CHR$ M
2065
2070
2075
      RETURN
2080
                     3000 "HONE" MADE
      REM GOSUB
2999
 TO FLASH FOR EFFECT.

000 FOR N=1 TO 10

005 PRINT AT 0,0,"

010 FOR T=1 TO 12

015 NEXT T
3000
3005
3010
      PRINT
              AT 0,0,"HOME"
S020
3025
      NEXT
      RETURN
3030
      REM .....YOU, LL NEED IT.
4000
4081
```



A REVOLUTION THAT RULAROUND ORDINARY JO





Competition

Win some Spectrum software in this easy-toenter competition...

After drawing so much on your creative spirit in past competitions in ZX Computing here sia fairly easy task for you to carry out

At you have to do is to search the wordsquare below for the titles of some of the most popular software on the market. And to make it really easy for you we've provided the names of the packages included in the wordsquare. Unfortunately for you, though not all the names in the list are included in the wordsquare you I have to find out how many actually are included.

To enter the competition, simply ring around the software titles you have found and count them. Then fill in the

coupon and send it off to us complete with your name and address. But, please remember to put the number of software titles you have found on the back to the envelope.

The prizes

There will be six winners to this competition, each picked at random from the Editor's hat

Each of the six prize winners will receive a special T shirt with the Visions Software Factory logo on the front and the ZX Computing logo on the

back These T shirts are being specially manufactured for the competition so, you can wear your original T shirt with pride

Along with a unique T shirt you will also receive one of each of the following Visions software packages for the ZX Spectrum

Pitman 7 Sheer Panic Repedes Snooker Ster Warrior Orpheus Sci-Fi So, good uck and please remember to put the number of titles you find on the back of the envelope

Rules

This compet tion is open to all JK and Northern sland readers of ZX Computing except employees of Argus Specialist Publications Ltd their printers and distributors employees of the Visions Software Factory, or anyone associated with the competition.

 As long as the correct coupon is used for each entry there is no limit to the number of entries from each individual

A I entries must be postmarked before January 31st 1984. The prizes will be awarded to the first six entries picked at random which have the correct answers, the decision to be made by the Editor of ZX Computing. No correspondence will be entered into with regard to the results and it is a condition of entry that the Editor's decision is accepted as final.

 The winners will be notified by post and the results will be published in a future issue of ZX Computing

Address your entries to

ZX Computing Wordsquare 146 Charing Cross Road', London WC2H OEE.

Results

Congratulations to lan Foster of Harrow, Roy Lane of Ripon and Paul Russe of Dunbartonshire for you have won the competition set in the Aug Sep saue of ZX Computing Rest assured, your AGF Hardware joystick package is on its way to you

Thank you to everyone else who entered the competition better luck next time!



- ASTEROIDS

 BLACK CRYSTAL

 COSMOS
- OO NOT PASS GO A GREEDY BULCH
- ✓ GULPMAN
 ✓ FLIGHT SIMULATION
 PENETRATOR
- * HUNGRY HORACE
- MINED OUT
 FOOTBALL MANAGER
 MAZOGS
- ▼ NIGHT GUNNER ✓ SCHIZOIDS
- STAR TREK PLANETOIDS ESCAPE
- *THE FAST ONE





JND ORDINA

Add the professional touch to your ZX81 starter pack



The complete range

The RS232 is an all-purpose interface which allows he ZX8, not only to output a suitable serial princers but car list up with numerous types of The interface has two main modes of operation. BASIC mode allows you to use the range of functions supplied in the RS232 EPROM within an ordinary BASIC program, and TERMINAL mode allows you to use your ZXB1 as a term has to another processor. The EPROM functions offered permit the bytes between ZX8 code and ASCII at well as check the sia as of numerous control fiegs. Received or transmitted data can appear simultaneously on the screen, and received data may be printed simultaneously £39.85 and V A T

Memopak Centronics I/F The BASIC commands PRINT LLIST and COP1 are used to print on any CENTRONICS type princer All ASC II characters are generated and

MEMOTECH

Memotech Limited Station Lase Industrial Estate Wilney Oxon, OX8 6BX. Telephone Witney 2077

within the pack. Reverse capitals give lower case. Additional facilities allow high rese ation printing

Memopak HRG

This pack breaks down the consulations imposed by operating at he ZX81 character level and abows high definition displays to be generated AL 248 x 192 adividual pixels can be controlled using sumple commands, and the built in software enables the user to work interactively at the dot. ane, character block and page levels.

Memocalc

The screen display behaves as a window on a large sheet of paper on which a table of numbers is laid out The maximum size of the table is determined by the memory capacity and with a Memopak 64K a table of up to 7000 numbers with up to 250 rows or 99 columns can be specified. £29.90 inc. v A T

Memotext

Text is first arranged in 32 character lines for he screen with comprehensive editing facilities. On output the user simply chooses the one length required for printing and the system does the rest Used with the Memopak Centronics Interface the Word Processor makes available printout with 80 character lines,

upper and lower case and single and double size characters. \$29.90 nc V A T

Memopak Memory Extensions
For those just setting out on the road o real compoung these packs ransform the ZXB from a toy to a powerful computer. Data storage extended programming and complex displays all become feasible. Further details available on request

16K Memopah £24.95 32K Memopak £34.95 64K Memopak £40.95 Prices neighbor of V A T Memopaks are available at mail branches of W.H. Smith and John Menzies.

280 Assembles

The Assembler allows you first to code and edit a source program in the 280 language and then assemble it into machine code. You can now write flexible and economic programs. The Editor mode allows you to code directly in the right format manipulate individual lines and control the exact placing of source and mach he code. Routines may be therged or asted even to a commercial printer using our Centronics Interface. The assembler mode handles all standard 280 mnemonics, numbers in hex or decimal, comments and user-selected labels. \$29.90 inc V A T

postage and packing.

To Order Send your Name. Address. Memopaka required, pius a Cheque /Postal Order Access/Barclaycard number please state which) to. Memotech Limited. Station Lake Industrial Estate, Wilney Oxon, OX8 48X. Telephone Witney 2077

We want you o be completely satisfied with your Memopak an our products carry a 14 day money back guarantee



984

lease

er of

ck of

en to sland ting WOLS Ltd 210 015 yone the

rrec1 ntry mber dual be uary. i be tries have the the No

bе the

n of

Sion

ified

и be

e of

JBre

ster

pon

of

ave

the

2x

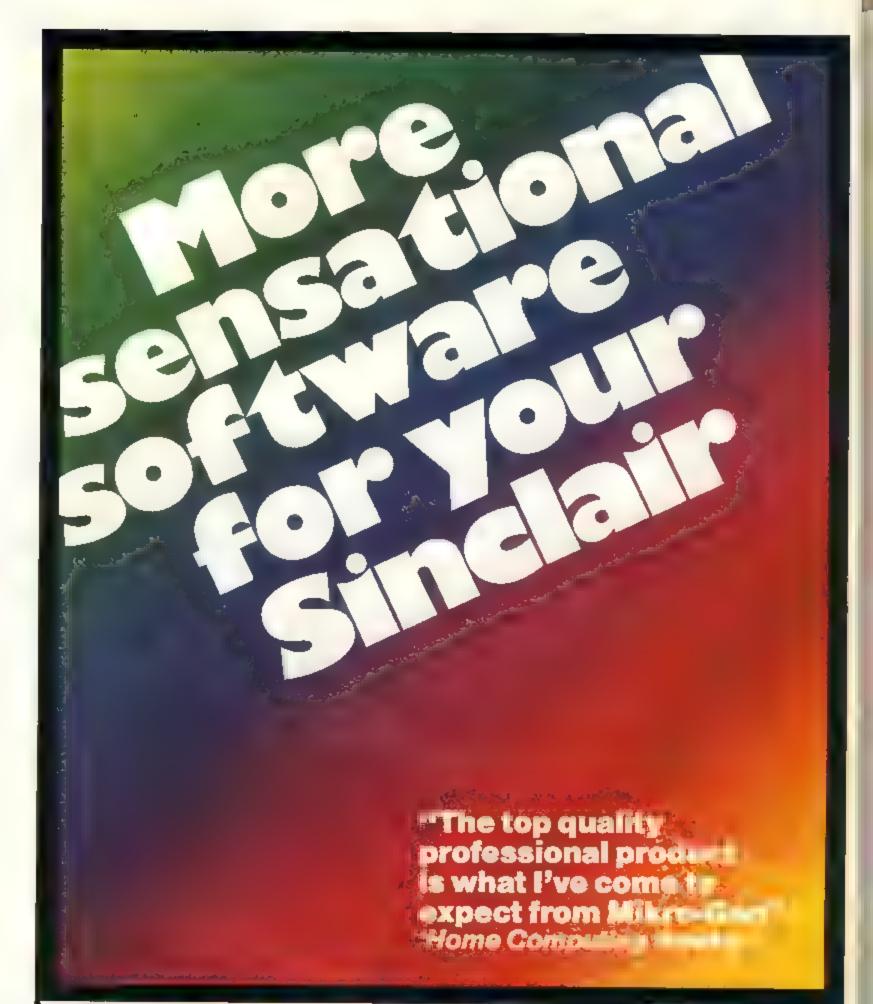
/OUT

ick

else

tion

eu



Latest in the range from

出公司的方式



Pat the Postman
Really original. All Pat
has to de is collect
parcels whilet
avoiding obstacles—
like care, fires, trains,
etc. Sidil level and
Hall of Fame.
465 batters, 18,65



Deflevelar
Earth is under attack
from mutant allene in
an accurate
implementation of a
top arouse garne—
and one of the meet
difficult to survive ini
66 Species. \$6.55



Cruise Attack
Save the city from
annihilation in this
wonderful version of
an arcade favourite.
Nine skill levels,
bonus points for
attack skips.
(6) Species, 96.56



Names
Catch the benemes, miss the occopiate.
Easy? Try it and see, Simple in concept, hilariously entertaining—ICE drive you benemes.
106 Spotter, 16.55



Timequest
A warp-space
scaldent spreade
year capsule across
time. As you land in
each new ers, fresh
perile face you. A very
skillful graphic
adventure
466 Spetrus, 66.95



One Hundred &
Eighty
That famous shout talls you what it's all about A good implementation of a difficult germe ~ doubles, trables, twenty-five and built sil pessible.

Spekrat, 16.55



Land of Sagan
A quest to find the
long lost Staff of
Health. Is it in one of
the centles? Or in the
Tower? There are
planty of problems—
and planty of
opponents—in this
great graphic
adventure.
dif Section. St.di.



Creepy Crawler
An authentic version
of one of the most
addictive arcade
games devised, All
the usual features
(Centipeds, Spider,
Bug, etc) with full use
of Spectrum graphics
and sound,
198 Spectrum, \$5.95



Mad Martha II
Great sequel to the feet-selling Med
Merthe. Hilarious graphic adventure, with hero Henry in sunny Spain, beest by wacky walters, mad fulls and the weathful Martha.

488 Spring, \$1.06



SAS Assault
Your mission – resease
the Russian
ambessador from
terrorist kidneppers,
before the Kremlin
declares wer, Loads
in two parts – your
rating in the escond
depends on your shill
in the first,
46K Spettus, SESS



Star Trek
Defenci the oter
systems against the
Klinger attack. Films
in real time—no you
have to make the
right decisions thist!
445 Spatrus. \$5.96



Braismann Find your way round Dracule's dornairs. A game to get your teeth into! 481 Speinm, 1845



Lacerwarp Invaders, Aliens, this game has the lot—and you have to survive to destroy the Master! Simple controls, for from simple task. 491 Spectrum, 18,95



Kneekeut No allens, lesers, Irweders or rockets-just simple but absorbing fun which up to 4 players can enjoy. 466 Sparies, \$6.66



Calekzione
Watch out as the
Galekzione breek
fermation to attack in
such force that no
more human can
survive!
100 Spotem CE-56

See them at Lightning, PCS, Tiger, Co-op, Menzies, W N Smith & other leading retailers

PHONE YOUR VISA OR ACCESS NUMBER

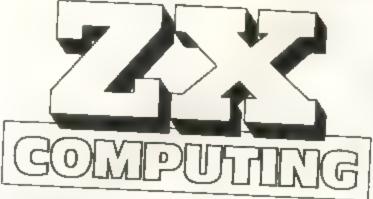
Other great new Mikro-Gen programs coming soon - watch out for them!

Please make cheques/PO payable to 'Mikro-Gen' and add 40p post & packing per order

加公司马马

Mikro-Gen, 1 Devonshire Cottages, London Rd, Bracknell RG12 2TQ Tel: 0344 27317

Britain's Biggest Magazine For The Sinclair User



Make sure you get every issue of ZX Computing - Now bi-monthly!

Just £12 10 will ensure the next six issues will be lovingly wrapped and posted to you. Just fill in the form below, cut it out and send it with your cheque or postal order (made payable to ASP Ltd) to

ZX Computing Subscriptions, 513 London Road, Thornton Heath, Surrey CR4 6AR.

Alternatively you can pay with your Access or Barclaycard in which case simply fill in your card number, sign the form and send it off. Do NOT send your card!

Make the most of your ZX computer with ZX Computing Now bi-monthly!



Subscription Order Form

Cut out and SEND TO



ZX COMPUTING Subscriptions, 513, London Road, Thornton Heath, Surrey CR4 6AR

Please commance my subscription to ZX Computing with the very next issue

SUBSCRIPTION RATES

(tick as appropriate) £12.10 for six issues UK

£13.60 for six issues overseas surface mail

£24 40 for six issues Overseas airmail

I am enclosing my Idelete as necessary, cheque/Postal Order International Money Order for E Imade payable to ASP LId; OR

OR
Debit my Access/Barciaycard*
i "delete as necessary:



Please use BLOCK CAPITALS and include post codes

NAME (Mr/Mrs/Miss)

ADDRESS

POSTCODE

Signature

Date

48k ZX SPECTRUM ADVENTURES - PICTURE GRAPHICS AND COLOUR



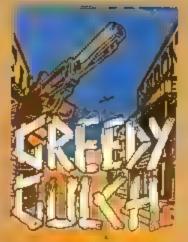
I'm are a Knight of Came, a Merlin vilos reasore On your way you will discrete the Witches Tower rose of Princess he has by he wicked Wizard of Fr. £5.95



You discover he en rance to an ancien py amid blocked by a rock. Once inside you discover his rooms are forms and other imps so by the barders of project the Pharail £4.95

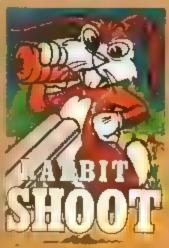


A rope abive a rack fissure is the my way mo this Magic Mountain or so? Legends to l co vast stores of freasure but also of poisonous spiciers lizards and magic at work



An old deserted mining town holds the clues to the local on of a lost gold time. Once in the mine, your problems are not over the roof creaksalarmingly and might cave in

16K ZX SPECTRUM GAMES AND PUZZLES



I is nearly dawn, you are posting rabbe to a field of reaction and many cream hap and exected by the game keeper a ghair rightal areadon can be an executive to be an executive to the control of t

48k ZX SPECTRUM GAMES



of the book Contains vix games including castle. Wals Great Fire of Lindon Reversi machine code assembler id sassembler i £5.95 Howk as a lable separate v £6,50



The traditional game with superb screen presentation. Score points by making the two ends add to a multiple of the or three. The first one to reach 77 paints wins.

bie it to reassemble the original squares. Machine coded. £4.95

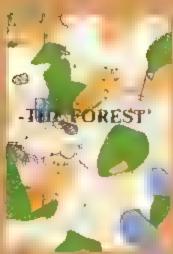




to the Black Planet volumeer 7. in his least hidder on In e con planets in a needing the terent prizzles at he solved. On the was you light off the pirates who is steadily more desperate. £5.95



You are Spectrasses but ing n stare can aim you obstone. To recover the cas, charge you must also win a swordligh, with Grang ans ag his cave.



Three dimensional simulation of the sport of orienteering Display is with nuclusty applated as you run ildea for map reading practice Instructions, colour map and casse te



the computer breaks and shuffles

a two by two coloured square.

whish you waigh the relives . makes I'm must her anscram-

For the ZX81 three adventures black and white text Magic Mountain, Pharach's Tomb. Greedy Guich as described above Superb value for money

PHIPPS ASSOCIA

Prices include postage (outside Furope add £1 00 per item).

Dept G FREEPOST EM463 (No stamp) 172 Kingston Road, Ewel., Surrey K T19 0BR Telephone 01-393 0283 24 Hour answering.

Access and Visa cards welcome





Spectrum 30 TANX



Spectrum CHNT1-HUG



Spectrum METEOROIDS



Spectrum
SPAWN OF EVIL



Spectrum SOUND FX



Spectrum DISTRON



Spectrum



Spectrum ZXED



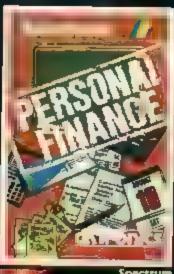
Spectrum DICTATOR



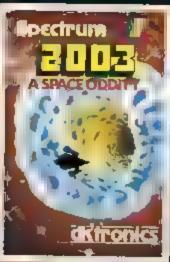
Spectrum



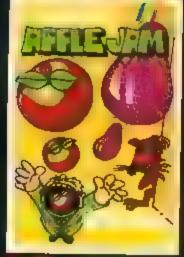
Spectrum TROM



Spectrum
PERSONAL PINANCE



Spectrum 2003



Spectrum
APPLE JAM



Spectrum
THE SLICKER PUZZLE



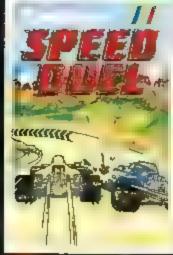
Spectrum MAZIACS



Spectrum
GOLD MINE



Spectrum DIET



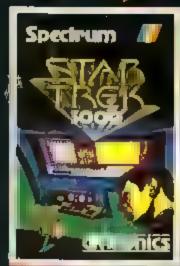
Spectrum SPEED DUEL



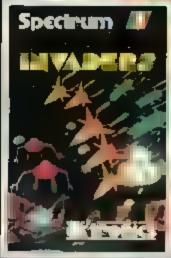
Spectrum GOLF



Spectrum ROAD TOAD



Spectrum STAR TREK 3000



Spectrum INVADERS



Spectrum JAWZ



Spectrum
HARD CHEESE



Spectrum
MUNCH MAN



Spectrum TRAMIX



Spectrum
GALACTIANS

The 1K coral

A galaxy of great programs rounded up for your 1K ZX81.

Although sometimes frust rating to work within the imited confines of 1K of memory, you may find t wor thin the to study how program mers have managed to utilise the memory space — something you may (and should) find useful even when

working within 16K or 48K

If you would like to contribute material to this feature, please try to explain the techniques you have employed to get your program into 1K And now, on with the show



Snaker Andrew Ford

In this program, you must guide a snake's head (represented by an 'S') to catch the files (represented by the 'I' characters). There is a time limit set and you must use the 5' and 'B' keys to move left and right respectively.

When the program is run, your snake is printed in the

middle of the screen. The fles travel from the bottom of the screen to the top, and it is your task to eat as many files as possible in the time limit. When you time has run out, your score will be displayed by the head of the snake.

Program breakdown

Here is a brief guide to the listing ine by line

Lines 10-20	Set the time I mit and zero the score
Lines 30-40	Set I and use variables for use within the program
Lines 50-60	Set the X and Y co-ordinates
Line 70	Sets a random number between 10 and 20 for the position of the flies.
Line 80	Prints the snake a head
Line 90	Prints the fly at the bottom of the screen
Line 100	Controls the movement of the snake's head
Lines 110-120	Check the display file to see if a fighes been eaten, and if it has add one to the score
Lines 130-140	Reduce the time by one unit and check to see if the time has reached zero
Line 150	Scrol's the screen
Line 170	Prints the score
Lines 180-200	Wait for a key to be pressed — if a key is pressed the screen is cleared and the program is run

"100"

BEVAL

LET SEPI-PI LET I=PI/PI

```
S=CODE
            LET
                      K=J
     50
                      Y = X
  60 LET Y=X
70 LET R=INT (RND+J)+J
80 PRINT AT X,Y:CHR$ 56
90 PRINT AT CODE '+ ,R,CHR$ 46
100 LET Y=Y+(INKEY$¤"8" AND Y (CODE '(") (INKEY$="5" AND Y)J)
110 PRINT AT X+I,Y,
120 IF PEEK (PEEK 16398+2564PEE 16399) =CODE "I" THEN LET S=5+I
            LET
  130
          LET S=B-I
140
            TE BEPT-PI THEN GOTO VAL "1
  150
            SCROLL
           GOTO VAL "70"
PRINT S
  160
  170
           PAUSE 4E4
  180
  190
           RUN
  200
```

555 I I I I I I I I I I I I I I I I I I	I S I I I I S I S I S I S I S I S
51 5 I 5 I	5 1 15 5 1 5
S 17 I	5 I 28 I
I I	I I I
ı	ı ı

A sample screen illustration from the game, Snaker

Ghost hunt A Murray

In this game, you must try and stop the ghost from reaching you not an easy task as you will soon find out!

You can manoeuvre your character up and down using the '1' and 'A' keys respectively, and you can fire at the

ghost using the 'P' key as your laser

You will score one point for each ghost you destroy, the score being displayed when you are reached by the ghost. To make sure of destroying a ghost you must aim your laser at the ghost's head, and be sure not to keep your finger on the 'P' key for too long.

```
5 LET S = 0
 10 LET A = 5
 15 LET B 0
 20 LET C = 10
 25 LET D=29
 30 LET X = INT (RND # 3)
 40 PRINT AT C.D. "space, inverse quotation mark"
 AT C + 2, D, "graphic T, inverse space, graphic Y"
AT C + 1,D, > "graphic 3, graphic 7 graphic 4"
50 PRINT AT A B, "inverse > "
 60 LET D = D - 1
 70 'F X = 0 AND D > 23 THEN LET C = C + 1
 80 IF X = 0 AND D > 11 AND D < 22 THEN LET C | C | 1
 90 IF X = 1 AND D = 22 THEN LET C = C | 5
100 IF X = 2 AND D = 22 THEN LET C = C + 1
110 IF D>3 AND D<10 THEN LET C=C+1
120 IF INKEYS = "P" AND A=C THEN LET S=S+1
130 LET A = A + ((NKEY$ = "A") - (INKEY$ = "1")
140 IF INKEY$ = "P" AND A = C THEN GOTO 10
150 IF D= 1 THEN GOTO 180
160 CLS
170 GOTO 40
180 PRINT AT 10,20, "SCORE # ".S.
```



Happy landings Christopher Dawber

n this program you must land your aircraft on the runway beneath you and bring it to a hat it sadvisable to lose as much speed at over haif the height you start at because your fuel will decrease by the amount of the number (your speed) below the runway displays You can decrease your speed by pressing the '5'

key Do not lose too much speed above half height or you will inevitably crash

Once you are below half height you must land on the runway, but do not decrease your speed after the asterisks or before the Graphic 2

To lower your sircraft you must press the '6' key but take care as you cannot make the aircraft go up again if you don't land and you pass the asterisks, you will come to a sticky end

- 115 F S = X THEN GOTO 130
- 120 LFT A\$ = A\$(Z + Z TO)
- 130 LET F = F S
- 135 IF H = CODE "graphic shifted 5" AND S<CODE "graphic shifted 5" THEN GOTO 210

- 140 LET H=H+(INKEY\$="6")
 150 LET S=S (INKEY\$="5" AND S>X)
 160 IF H-CODE ' graph c shifted D' and S <> X THEN GOTO 210
- 161 F H>CODE "graphic shifted D" THEN GOTO 210
 162 PRINT AT CODE "E", X,S, "space"
 163 IF A\$(Z) = ' graphic 2" THEN LET L Z

- 170 IF F< X THEN GOTO 210 180 IF A\$/Z) = "inverse #" THEN GOTO 210
- 190 FH = 9 AND L = Z AND S = X THEN GOTO 250
- 200 GOTO 100
- 210 PRINT AT H,X,"3 pverse *,",Q 250 PR NT "WELL DONE
- 260 PRINT AT H Z X,"3 spaces", TAB X,"graphic shifted W, graphic shifted F, graphic shifted 4"

LET X = PI-PI

- 2 LET Z = PI P
- 3 FT H=Z
- LET S = CODE "graph c shifted S"
- 5 LET F = CODE ' graphic space'
- LET L = X
- 7 LET As = "10 graphic shifted A, graphic 1 10 graphic shifted A, graphic 2, 5 graphic A, 10 graphic \$"
 100 PRINT AT H-Z,X,"3 spaces",AT H X, graphic shifted
- W.graphic shifted F, graph c shifted 4"
- 110 PRINT AT CODE "graphic shifted S", X, A\$IZ TO CODE graphic shifted S''s

Clock Brian Buckley

When you have entered the program, press the RUN key and then the Newline key You

will be greeted with a prompt to enter the hour. Once you have done this, you will be presented with a further prompt to enter the minutes. The clock display should then ap-

45 Y 46

Y 1

64PEE 5=5+T

D

9£

I

1

1

I

as your

iomt for oy, the when ghost oy ng a

ur laser

and be

nger on

1984

1K ZX81PROGRAMS

pear at the top centre of the SCIBED

Here is an example of how you would set the clock to read 12 15

1 RUN the program Press '1' followed by '2' followed by Newline 3 Press Newline (or any key except Break)

The display will now appear showing '12 00'

4 Press Newline (or as above, any key but Break) 15 times

The display will be seen to advance by one minute after each depression of the key until t reaches 12 15

Program description

This is how the program works, Ine by line After responding to the screen prompts contained in lines 20 and 50, the clock display is printed by the PRINT statement in line 100, but only if the input for one 30 is greater than nine (10-23) if this input is less than 10 (zero to nine), then the display is printed by line 120 which places a zero in front of the hour digit

The minutes are timed, printed and updated by the loop between lines 130 and 200 If the minutes are greater than nine, ind 180 prints them after the colon which separates the hour digits from

the minute digits, however, if the minutes are in the range zero to nine, then line 160 prints a zero in front of the minute digit. The PAUSE statement in line 190 controls the timing to an accuracy of greater than one second per hour Line 210 increases the hour digrt(s) by one after leav ing the minutes loop after the 59th minute. When the hour (H) is greater than 23 the displayed hours will change to '00 00' because of line 220 Line 230 keeps the program running by returning control to line 80

10 REM "CLOCK" 20 PRINT AT 20,0, "INPUT HOUR" 30 INPUT H 40 CLS 50 PRINT AT 20,0, "PRESS N/L TO ADVANCE MINUTES 60 INPUT AS 70 IF A\$ = "" THEN CLS 80 iF H < 10 THEN GOTO 720 90 IF H>10 THEN GOTO 100 100 PRINT AT 0,13, H, " " 110 GOTO 130 120 PRINT AT 0,13, "0", " " 130 FOR N = 0 TO 59 140 IF N > 9 THEN GOTO 180 150 IF N<9 THEN GOTO 160 160 PRINT AT 0,16, "0", N 170 GOTO 190 180 PRINT AT 0,16, N 190 PAUSE 2985 200 NEXT N 210 LET H H + 1 220 IF H >23 THEN LET H=0 230 GOTO 80

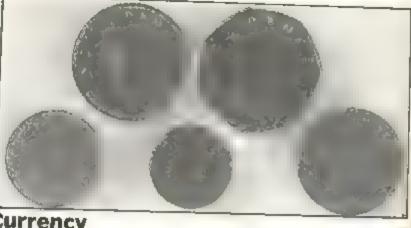
Races **Guy Jones**

The dea of this game is to choose the horse you think is going to win the race out of a field of three. All you have to do to choose your horse is to input a number, either '1', '2', or '3 After doing this you input a suitable bet - you start

off with the sum of £100

Once you have input your bet, the race is run and you are told whether you have won or lost. Your initial money is then either decremented or in cremented and you are invited to take part in another race The game ends when you have run out of money

- 10 SAVE 'RACES"
- 20 LFT M = 100
- 110 LET H = INT (RND * 3) + 1
- CLS
- 117 F M < = 0 THEN GOTO 300
- 120 PRINT "RACES", AT 2,0, "1 NON STARTER", AT 3,0, '2 ABSOLUTELY", AT 4,0 "3 GOLDEN BOY", AT 6,3, "ENTER HORSE (1,2 OR 3)"
- 130 INPUT A
- 140 PRINT AT 8,0, "ENTER YOUR BET(UP TO E",M, ")
- 145 INPUT B
- 146 IF B>M THEN GOTO 145
- 147 IF A = H THEN LET B = 8 # 3
- 150 FA=H THEN LET M=M+B
- 155 IF A<>H THEN LET M = M B
- 160 IF A = H THEN PRINT AT 12,2,"YOU WIN"
- 170 F A<>H THEN PRINT AT 12,2 "YOU LOSE"
- 180 PAUSE 30
- 200 GOTO 110
- "YENOM ON BY""JOY" TAINS ODE



Currency conversion J Howard

This is a short and simple program which was convert English sterling into four other Currencies

When you run the program, you wil, be greeted with some short instructions asking you to enter an amount in sterling The program will then present you with the amounts in American dollars, Deutschmarks, Swiss francs and French francs. The figures will be held for 15 seconds while you make a note of them, the

screen will clear and you will be invited to enter a new amount of you wish the amounts to be left on the screen for longer you can always after the PAUSF in tine

The amounts calculated are given in line 70 so you will have to make sure there are accurate for the day you make the calculations so that your conversions are correct

To get the copy displayed properly on the screen, you should leave four spaces after the word 'BE' in tine 20 and the word 'CONVERSION in one 40

- 10 REM Currency Conversions
- 20 PRINT 'ENTER STERLING AMOUNT TO BE CON-VERTED"
- 30 GOTO 50 40 PRINT "THIS IS A CONTINUOUS CALCULATION PRO-GRAM AFTER EACH CONVERSION ENTER A NEW STERLING AMOUNT
- 50 PRINT AT 10 0, "POUNDS", "DOLLARS",
- 'D MKS",, "SW FCS",, "F FCS" 60 INPUT P
- 70 PRINT AT 10, 16, P., P * 1 54,, P * 3 91., P * 3 22 P # 17 75
- 80 PAUSE 750
- 90 CLS
- 100 GOTO 40

Pedestrian Martin Bradburn

This is a fast action game for the unexpanded ZX81

Your mission is to guide your pedestran across a busy road, dodging all the vehicles

which obstruct your way. You must use the '5' and '8' keys to move backwards and for wards respectively

The 'A' in the 4 and line 10 and the D' in line 6, should be entered in Graphics mode

- 1 LET A = VAL "10"
- LET B = CODE " "
- LET S = B 3
- PRINT AT CODE "<",INT (RND # 30) "A" 4
- 5 SCROLL
- PRINT AT A,B,"D"
- PRINT AT A,B,"
- IF B VAL "30" THEN GOTO 12 8
- LET B = B + (INKEY\$ = "8") (INKEY\$ = "5") IF PEEK (PEEK 16398 + 256 # PEEK 16399) = CODE "A" THEN LET S = S + 1
- 11 GOTO VAL '4'
 12 PRINT "YOU GOT RUN OVER ",S," TIMES"
 13 PAUSE VAL "200"
- 14 CLS
- 15 RUN



Tower attack **Gregory Briggs**

You control a tank which is situated to the west of the enamy is aircraft control tower You must judge the amount of gunpowder required to project the sher to the tower and thus

destroy it

n ine 10 you will need to enter a Graph c shifted '7', one 25 contains a Graphic shifted 'P', line 30 includes a Graphic space and a Graphic shifted '7', and last y line 80 contains a space and a full-stop within the double guotes

1 REM 'ATTACK"

2 CLS

וועע עונ

the

n the

can

in ne

ed are

PB BC-

make

VOUL

layed

YOU

after

) and

N′ ≀n

0

2,

You

(eys

for-

10

d be

984

3 LET L = 1

LET S = INT (RND # 11) + 17

FOR F = 1 TO 30

10 PRINT AT + 0,F," ■"

20 NEXT F

25 PRINT AT 19,8 " " "

30 PRINT AT 19,1," == "

PRINT AT 0.0 'ENTER AMOUNT OF GUN POWDER(1 TO 28,

50 INPUT C

60 FOR R : 1 TO C

70 LET L = L + 1

80 PR NT AT 18,L," ."

90 NEXT R

95 IF C <> \$ 2 THEN GOTO 200

100 PRINT AT 12,6," TOWER DEMOLISHED ■" AT 19 L + 1,"

101 PRINT AT 14,5,"ANOTHER ROUND(Y/N)"

102 INPUT AS

103 IF A\$ = "Y THEN GOTO 2

104 STOP

200 PRINT AT 12,8," YOU MISSED TO

210 GOTO 101

U-boat **Neil Stevens**

J-boat is a 1K ZX81 game, written partly in machine code to speed up the game and save memory. The machine code's role in the listing is to print the initia screen, scroll the top line and to re-print a boat on the top line

You should first enter the machine code loader shown in Fig. 1 After running the program, you should delete lines 10-70 and enter the main pro-

gram shown in Fig. 3. When run the line O should contain all the machine code. The machine code has been shown in more detail in Fig. 2.

The program displays an enemy vessel chugging merrily away across the top of the screen. You are positioned in your submaring at the bottom of the screen. To destroy the enemy craft, you must press any key (except for the Space key or the Shift key) to launch your torpedoes

Fig 1

1 REM 62 characters

10 LET A\$ = "3E00061DD710FD3E81D73F83D73E00D7 3E0806A0D710FD3E800620D710FDC92A0C40545D2 32313011F00EDB0C92A0C40061D23360010FB23368 123368309

20 POKE 16510,0

30 LET X = 16514 40 POKE X,16 * CODE A\$ + CODE A\$(2) 476

50 LET X = X + 1

60 LET A\$ = A\$(3 TO)

70 GOTO 40

Fig. 2

Print acreen:

3E 00	ld A,O print top line
06 1D	ld B,29
D7	Rst 10
10 FD	D ₁ n2 3
3E 81	ld a, 129 Print boat
D7	Rst 10
3E 83	kt a, 131
D7	Rst 10
3E 00	ld a, O
D7	Rst 10
3E 08	ld a, 8 Print sea
06 A0	ld b, 160
D7	Rst 10
10 FD	Dinz-3
3E 80	ld a, 128 Print Seabed
06 20	d b, 32
D7	Rst 10
10 FD	
_	Djnz 3
C9	Ret

Top line scroll:

2A OC 40 54 5D 23 23 13 01 1F 00 ED 80 C9	id D,H Id E,L Inc HL Inc HL Inc DE	
Re print	the	boat-
2A OC 40 06 1D 23 36 00 10 FB 23 36 81 23 36 83 C9	Id HL (D4) Id B, 29 Inc HL Id (HL),0 Ojnz 5 Inc HL Id (HL),12 Inc HL Id (HL),13 Ret	29

D REM (machine code) 10 LET'S = NOT PI 20 LET L USR 16514

30 LET A = NT(RND * 30)

40 PRINT AT 5,A, "graph c S, I, graphic S" 60 FOR F = 28 TO - 2 STEP - 1 70 F INKEY\$ <> "" THEN GOTO 200

80 LET L = USR 16545 100 NEXT F

110 LFT S = S - 1

120 PRINT AT PI # PI, NOT PI, S, "space"

130 LET L=USR 16559

135 PRINT AT VAL"5", A, "3 graphic A"

140 GOTO VAL"30"

200 FOR 0 = VAL"4" TO PI/PI STEP - 1

210 PRINT AT 0,A + 1," * ",AT 0,A + 1 "graphic A"

220 NEXT O

225 LET S = S 2

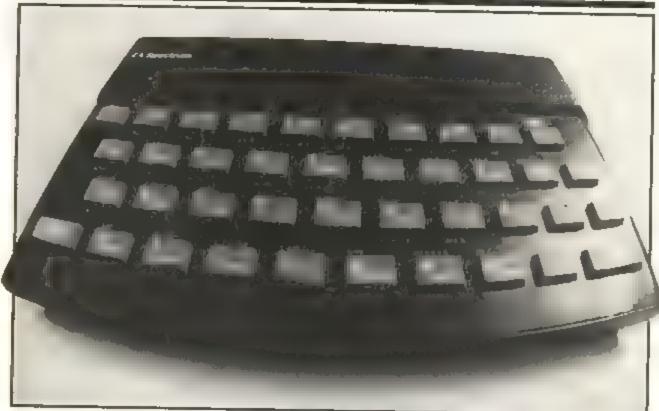
250 IF A = F OR A = F + 1 THEN LFT S = S + 6

260 PRINTAT PI #PI, NOT PI, S, "space

270 GOTO VAL "80"

Structured Programming

Sketching an outline, an approach to structured programming on the Spectrum by Tim Hartnell.



Many times I ve written articles and chapters n books, which are supposedly going to improve the programming skill of those whose read them. But every time I produce such a list of 'things you really should be doing when you program', or explain the same material to someone, I am reminded of an old story about a farmer.

He was approached by a young man selling correspondence courses in 'Effective Farming ''Don't you see," the young salesman said as part of his pitch, "that if you take this course, you'lk know so much more about farming?" The farmer replied "I don't even farm now as good as I know how "

So it goes, I suggest, for advice on programming I know full well that I do not programme as good as I know how. Many times I break all the rules, wading straight into coding a complex program without even a thought for the

dictates and structures of 'structured programming'

So I suggest you keep in mind, when reading this artice, that I do not really believe that you or anyone else is really going to take them as final gospel from the great master rules which must be obeyed if your mortal soul is not going to be put into dre peril. The best way to approach this and any other material in a similar vien which you come across - is to read it carefully, and make your own assessment on each suggestion given. Then, just apply the things which seem OK to you.

Basically...

The basic idea I'd like to outline in this article is that of approaching structured programming with the idea of 'sketching an outline'

The idea is simple, but very valuable in order to help you

write complicated and nvolved programs. Of course, you may well be already creating very complex programs without using anything like the idea ('m about to outline. Even if you are. I suggest you think carefully about these ideas, so that you can see that they may make your job easier.

The fundamental idea of structured programming lies hidden in the phrase 'top down programming'. This suggests that you start the process of programming by first stating in words the broad aim of the program you are about to write. You follow this up by writing a series of notes each of which will eventually be a subroutine—which cover each of the main tasks which

the computer will carry out
To clarify this last
paragraph, I'll give you a
concrete example Here are
the steps you could follow
when trying to write a

'Noughts and Crosses program (I must point out that structured programming produces sistings which are much longer than might otherwise be the case However, this greater length # more than offset by the fact that progrems built up in the way are very simple to debut and improve, and their structure can be readily understood by programmers a claim which you are unlikely to be able to make with confidence about some of your current programs,)

SET UP INITIAL BOARD COMPUTER MOVE

SQUARE IS EMPTY IN NOT, MOVE HERE

(b) CHECK IF THERE IS A COMPUTER WINNING MOVE, IF SO MAKE IT

(c) CHECK IF HUMAN WILL WIN ON NEXT MOVE, IF SO BLOCK

(d) IF NO MOVE MADE CHECK TO SEE IF A RANDOM MOVE CAN BE MADE, IF SO MAKE IT, IF NOT DECLARE A DRAW

PRINT BOARD
ACCEPT PLAYER MOVE
PRINT BOARD
CHECK IS PLAYER HAS WON,
IF SO STOP
GOTO 'COMPUTER MOVE

As you'll see if you take a few moments to study this sketched outline, the outline tells you exactly which steps the computer will follow, the decisions it will be called to make, and the alternative results of those decisions.

You have already completed the first step towards writing a 'Noughts and Crosses program You'll see, by the way, that it doesn't matter at all if you do not yet know how you are going to get your Spectrum to carry out the necessary steps at that matters is that you have some awareness that the steps must, in some fashion, be executed in due course

Secondly...

The second step of the process consists of turning the sketched outline into a series of subroutine calls in languages which are more structured than Spectrum BASIC (such as BBC BASIC, or Pascal, which the BBC BASIC designers obviously used for inspiration) it is relatively easy to call a number of subroutines within an endless loop with a struc-

osses'
out that
nming'
chare
might
case
ongth is
he fact
in this
debug
their
read ly
other
which
able to

TY FEETS ANNING CE IT I WALL

about

urrent

MADE F A CAN MAKE ARE A

WON, VE'

a few
this
justine
steps
v, the
ed to
justive
steps
colleted

oleted ting a sses y the ter at your the that some

steps

, be

ocess etch is of lages tured ch as which s ob en), it

/ithin

truc

1984

ture like DO WHILE or REPEAT/UNTIL These allow you to repeat a series of program steps indefinitely until a certain condition is satisfied, or the state of pointer or flag changes.

n Spectrum BASIC, we have to be content with the humble and much-maligned. GOTO Much of the react on against GOTO which many serious programmers' see as the greatest insult to the art of true programming ever developed came from early and relatively primitive versions of BASIC, in which you could only follow an IF/THEN with a GOTO This meant the program leapt all over the place leading to spaghetti code' which was horrendously difficult to nterpret. The BASIC supplied with the standard TI 99/4A only supports a GOTO after an IF THEN producing some extraordinar y convoluted programs, as you'l see if you look in books of TI programs)

Now, of course, we can do a most anything after an IF/THEN (including such things as LISTing). Old habits die hard, however so the judgementa favour of the pronouncements against GOTO are sure to continue. This should not bother us, as we are programming to produce programs which run we and are clearly structured and GOTOs do not necessarily interfere with the selams.

Anyway to get back to the second stage of our ntroduction to structured programming. We can convert the sketch outline given before into a series of subroutine calls endlessly cycled by a GOTO, as follows.

- 10 REM NOUGHTS AND CROSSES
- 20 GOSUB 9000 REM
- 30 GOSJB 1000 REM COMPUTER MOVE 40 GOSUB 8000 REM
- PRINT BOARD 50 GOSUB 2000 REM
- ACCEPT PLAYER MOVE 60 GOSUB 8000 REM PRINT BOARD
- 70 IF HUMAN HAS NOT WON AND COMPUTER HAS NOT WON THEN GO TO 30
- 80 PR NT CONGRATULATIONS OR OTHER MESSAGE

Now as you can see we have the framework' for a workable Noughts and Crosses' program even though we do not yet have a clue how the program will actually work. We can now set about writing the program from first principles.

There are two further advantages of this outline approach if there is something we cannot, at this stage, actuelly program (like the basis upon which the computer finds out who has won) we can simply put in a PRINT statement within the subroutine like PAINT 'CHECKING FOR WIN" and continue to use the program, as we work on t Then, each time the computer should be checking for a win, it will print up 'CHECKING FOR A WIN' This means that you can continue working a minor subroutine section which you cannot, for the moment, solve

The second advantage comes towards the end of the program development stage, the debugging stage I always find this the most frustrating, and in many ways the least rewarding aspect of programming Aithough can get a program working reasonably well fairly quickly (a though my first Chess in BASIC took nearly six months), to get the program from 'working reasonably well' to 'performing without faults under all conditions' can take as long as it took to get the first version even working at all However, when you set up the program in the way described in the article, you'll see that the debugging stage can be considerably simplified

You may find for example, in your Noughts and Crosses' program that the computer tends to ignore the bottom right hand corner, when a move into this position would enable it to win, or to block a win from the human. From the 'subroutine cop' we set up before, we know the computer's move must be made somewhere between ones 1000 and 1999. This immediately narrows down the search If you have been crever and have made each subrouting a series of further subroutines, each constructed n a similar way to our major subroutine it would be even easier to track down the bug

Difficult?

Let's ook at this idea making each subroutine a series of further subroutines a little more closely. We'l look at the subroutine starting at line 1000, the one in which the computer actually makes it move, as this a most important (and difficult to

program) of all those in this program

The subroutine could begin as follows

- 2000 REM COMPUTER MOVE
- 2010 LET MOVE = 0: REM IF THIS BECOMES 1 A VALID MOVE HAS BEEN FOUND
- 2020 GOSUB 2200 REM CHECK IF MIDDLE SQUARE EMPTY
- 2030 IF MOVE = 1 THEN RETURN
- 2040 GOSUB 2400 REM CHECK IF A POSSIBLE WINNING MOVE
- EXISTS 2050 IF MOVF = 1 THEN RETURN
- 2060 GOSUB 2600 REM CHECK IF A POSSIBLE HUMAN WIN CAN BE BLOCKED
- 2070 IF MOVE 1 THEN RETURN
- 2080 GOSUB 2800 REM CHECK IF ANY MOVE AT ALL CAN BE MADE
- 2090 IF MOVE 1 THEN
- 2100 REM A RETURN WITH MOVE = 0 MEANS NO FURTHER MOVES POSSIBLE

2110 RETURN

As I said earlier, programs constructed using the 'endiess loop of subroutines' coupled with 'subroutines with n subroutines' makes listings which may be far longer than usual However there is usually little need to worry about running out of memory on the Spectrum (unlike the 1K) ZX81, when counting bytes became the dominant feature of our programming lives) Therefore the longer listings will be amply repaid by the extra clarity your programs attain, and the much shorter time it will take to produce a debugged masterpiece of which you can be proud

Finally...

Finally, I'd like to give you a few more 'sketched outlines' which you may wish to try and turn into complete programs. Once you've done this, you'll have a much better idea of how the whole process works.

First we'l look at John Conway's famous Life program, which mitates the ife, birth and death of a colony of cells. The sketched outline could be as simple as

INITIALISE PRINTOUT COLONY UPDATE COLONY GOTO PRINTOUT

This might be seen as cheating, as it gives little clue as to how the program can be implemented However. assuming you knew the rules (which are given in a moment) you could produce a perfectly adequate program starting with a simple routine like this (The rules, so you can work out your own Life program, assume that the cells are on a grid, and the future state of each cell is determined by reference to the eight cells surrounding each cell on the gnd if the cell at the centre of the eight is empty and there are exactly three calls occupying surrounding positions, a new cel-s born in that posit on the next time the colony is printed. If there are four cells in the surrounding Squares, and the position being used for reference contains a cell that cell dies in the next generation If the position being checked contains a cell, but the surrounding positions ere all empty, the cell dies in the next generation if there are two cells in the grid positions around that being checked, the centre position remains unchanged)

Now, we'l took at a sketched outline of a 'Breakout' type game, which you can use as a framework for building your own program

IMITIALISE
PRINT BAT BALL, BRICKS
MOVE BAT
MOVE BALL (BOUNCE F
NECESSARY)
IF BALL HAS HIT BRICK,
REMOVE BRICK JPDATE
SCORE
IF BALL S IN LINE WITH THE
BAT, CHECK TO SEE IF BAT
WILL DEFLECT IT IF SO GO
TO 'PRINT BAT, BALL,
BRICKS, IF NOT GO TO
'REDJCE BALL TOTAL
SUBROLTINE
IF NUMBER OF BALLS IS
GREATER THAN ZERO THEN
GOTO 'PRINT BAT, BALL
BRICKS'

You lifted that if you start like this, the whole process of constructing a major progam is much much simpler than might otherwise be the case. You li also find that the time involved will be much more constructively spent than it would have been if you'd just waded into the programming without taking the time to sketch your outline first.

ignore the young salesman, and try now 'to program as good as you know how' MicroCare

microcomputer repair service

Offer a MicroCare warranty with its distinctive, specially designed presentation cover. A super gift for any computer owner! Warranties for most of the popular computers are available, at prices which are very low for what they give, A year's peace of

The sooner you buy a warranty, the cheaper it could be Look at the table to determine for how little mind. you can place MicroCare's expertise at someone's disposal this Christmas, giving them A year's peace

Consider some of the advantages of a MicroCare of mind.

- 1 You may send your computer in for repair as often as necessary during the warranty period
- 2 Your computer receives expert attention and care
- After repair it is thoroughly tested and
- The small print on the warranty states that MicroCare's liability extends to the repair of electronic faults, or replacement of the computer if found to be irrepairable

What more could you want? Buy someone a year's peace of mind. We have the experience it takes. We have the parts on hand So act now, keep someone s computer ' humming"

Consider some	of the advantages of	SCHEME P	SCHEME C Cost of 12 months warranty it manufacturer a guarantee has expired.	ONE OFF SERVICE PETAIR SERVICE 625 90
Model	Cost of 12 month warranty (Flees than 90 days old	£21 90 £21 90	£29 90 £29 90 £29 90	£25 90 £25 90 £25 90 £25 90
Atari 400 Atari 800 BBC A BBC B Commodore Vic 20 Commodore C 64 Dragon Acorn Electron Oric Comyx Lynx Spectrum	£14 90 £14 90 £14 90 £14 90	£21 90 £21 90 £21 90 £21 90 £18 90 £18 90 £18 90 £18 90 £18 90 £18 90 £18 90 £18 90	£29 90 £29 90 £29 90 £25 90 £25 90 £25 90 £25 90 £25 90 £19 90 £25 90 £25 90 £25 90	£25 90 £22 50 £24 90 £22 50 £22 90 £22 90 £22 90 £15 50 £22 50 £22 50
ZX81 Sirius Jupiter Ace Texas T199,48	£12 90 £12 90	£18 90	/illas, London N7 7PH	Tel: 01 609 7919

Sirius Jupitor Aco Texas T199,48	£12 90	orks, Thane Villas, London!	N7 7PH 181.01
- MicroCa	LE		
for computer's models	warranty warranties for so	serial numbers out to MicroCare, or I would like t	o pay by Access or Barclay Card
and I enter my number and	i signature accordingly	Occupation	
Name Address		Bale —	nder scheme A or B please enclose med with your Micros are warranty
Signature	Please note that the original man	(you are applying to you are applying to	

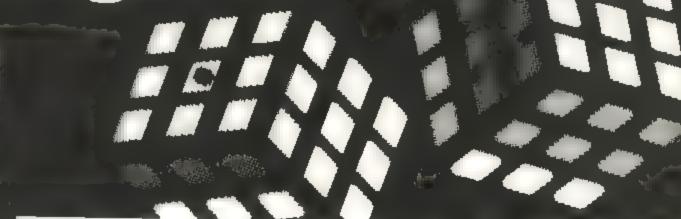
Buy one, get one FRE in our great cube extravaganza

Sur. 30 Rubbes Cu uden program with its randen start, cube unecramble and LOAD or SAVE featured for your 16K or 48K ZX Spec we'd charge you is

nd

net's Pentacube? Well: sught solving a three by then wait until you've ill a five by five by five verible to make but mulate on a make but model — this program nevs a challenge to even installation of cubists.

der your copy of Tube and so get your free of Paracounte; just send to Tube Cube Offer, Settwee, 145 Charing Reed London WC2H



Please send me Tube Cube plus my free Pentagube program @ £5 95 all inclusive of P&P and VAT

Lenclose a cheque/PO for E

spayable to ASP Ltd) or Debit my Access/Barclaycard (delete as necessary

Please use BLOCK CAPITALS

Address

Signature

ZX Computing

Please allow 21 days for delivery

Postcode

All programs are for the 48K Spectrum

THE DIETICIAN - £6.95

Dietician scientifically based program to help you ease off those excess pounds without exhausting aerobics.

Calculate your own diet, choosing the foods you want to eat. Lose weight at your own pace. The computer Looking for a long lost uncle to brings you the freedom to personalise your dieting. (Also available for the CBM64 --£7 95)

Dealer enquiries welcome

1984

PRESENT

FAMILY PACK I - £8 50

The big value software cassette for the family Includes 4 programs:

Bank Account - keep out of the red!

Address File —

computerise your little black book!

Shopping List Printer — A helpful reminder.

AND an addictive (nonviolent) 2 player game for the young at heart.

FAMILY TREE - £6.50

leave you a fortune? Are you related to someone famous? Use this program to keep records to trace your family links. Even produces a familytree diagram. Options to amend, update and browse through the family records.

KEYFILE - £7.95 MICRODRIVE COMPATIBLE

Lots of uses in the home or business — versatile filing program with up to 40 userdefinable fields. Options to save onto MICRODRIVE or cassette.

Menu driven, User friendly Fast machine-code search

Variable length records to give efficient use of memory

Orders GR

Post Code

Please allow 28 days for dalivery Postage paid for U.K. Add 15% for Overseas orders.

ZX COMPUTING DECEMBER 1983/JANUARY 1984

BOX CLEVER



GANGSTER Air you use, hearled and callous enough o war an the fills of Don You need to be flyding a torise to the top of the pile. A quick digger finger and an even quicker brain are needed to control the inobs and their rackets, 48K Spectrum.



ABYSS Can you journey across he long-forg—ten Abyss and outwil he evil monsters tha rule in he shadows awaring the roothardy and caroless adventure. There are many bridges and many monsters. Will you be the one to make the Abyss sate o cross again 48K Spectrum.



BYTE The chips fell y are down in this hair valsing game. Complete the ten circuits you need to boild your computer system her return home. Easy Byte has sent its alectronic monsters to harry you through his three dimensional maze of circuitry it any of them catches you. 48K. Spectrum.



PLUNDER Can you single the king of Spanish ships on the high sides survive their broadsides and punder the gold destined for the Armada and you might get your knighthood before Francis Drake 48K Spootrum

4

Ava able from Greens Boots Rumbelows and all good computer shops or Cases Computer Simulations Ltd., 14 Langton Way, London SE3 7TL.

Strategy Games.

They're no pushover.





CIO

SPECTRUM 2 Super Gamer on each tape! SEE

Road Race
A 30 moving road
a seen through the
windscreen. You
must stay on the
road for 46 miles
full control of gas,
geors, staering.
Full cookpit display.

SOCCOP 6 a and garns for 2 players. Rebounding belt, moving men, scores act, goels, fouls. Plan view of pitch GOH Pley your way round a Shole rendern course. Each hole is set with bunking, out of bounds 6 water hazeres 30 graphics Pulliset of clubs, putting, full score display.

Ber Billierds 1 or 2 Players Computer plays 1 Red ball, break and total scores, plan View of table with

0.7

mushrooms.

Klude fore to a players with rooms weapons, suspects. Full board display, rendom solutions and dealing Good fun for all the family



Bettleships You tattling the computer in this popular board gerns. Set your fleet, computers is random Stormforce
An original board
game for 8 players,
Each player heats
pommendos and a

game for 2 players. Each player has 8 commendes end a field gun Capture the enemies fing Hidden mines and ection graphics.



Starbuster
You are hommed in
by a galaxy of stars
noves and super
noves. Blact them
to bits and move
High soons chart

NEW!___ War of the

Worlds
Superfeat MC!
3G maving display
Lisers, shields,
E pert inciders,
3 levels, Guick
resctions needed!



Master of the Rings Avoid losing lives, Bearch stude pit, revine, trees, maxe, block rings, dark ciders. All with trape Find Shidden rings. Author graphics. NEW!

Card parties:
PATIENCE (1)
SNAP (2)
PAIRS (2)

GOLITAIRE (1)

HANGMAN (18)

COUNTORWN (1)
Prevent the launch
of a rocket after
breaking out of
jail 30 graphics.

o A III k

SPECTRUM 48k "HOUSE KEEPER"

A POWERFUL TOOL FOR THE GUST HOUSEWIFE Features:

● User friendly ● 25 pages (A-2) 30 lines per page ● Holds:

Provision name Stock quantity Unit of qcy Unit price Min stock level Mas stock level Works with ce

* Works with or without printer * Seve routine COMPILES A SHOPPING LIST OF LINDER STOCK FTEMS WITH CITY

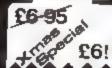
NEEDED AND TOTAL PRICE OF LISTED ITEMS

2X81 * E 6 for 2 .

ESthe full OFF

OFFER alls Cigil for2

for2 SPECTRUM for2 £4.50 each



ORDERS RECEIVED BY DEC 19th despatched for Xmas(inland only). OVERSEA add 50p per tape. Allow 7 - 14 days delivery. Tel. 0376-22425. SEND. CHEQUES OR POSTAL ORDERS TO- MISOW MICROS, BINEWNHAM CLOBE, BRAINTREE, ESSEX CM77PR

Burglars

Steal away a few quiet moments and play this great little game by Andrew Brydon of Sunderland.

100

ilgh

1984



In this game you play the part of a burglar who has decided to burgle the safe from the Arich household. You are represented by the 'O character and you move about the room using the cursor keys on the ZX81.

Your accomplice in this mis ston has been inside the room and has provided you with an idea of what to expect in the room, including the fact that the safe is surrounded by pressure pads. Your accomplice has even managed to deactivate some of the pads, but has neglected to tell you which ones good accomplices are so hard to find these days!

To get to the safe you must

move carefully around the chairs and tables in the room, so as to keep the noise down. Then, you must make your way to the safe keeping clear of the alarm pads if possible. You must then, and on the symbol beneath the safe to steal the loot.

You thave to hurry though, as the watchman checks this room every now and then and you wouldn't want to get caught would you?

Line by line

Here follows a brief look at the program which should help you understand the listing a little bet fer.

Lines 10:45 Lines 49:75 Lines 90:140	Print the instructions Set up the variables Move your character about the house
Lines 150 190	See if your character is caught or has reached the safe
Lines 200-999 Lines 1000-1030	Set up the alarm pads Set up the house display
Lines 1500 1595	Tell you that your character has been caught. Tell you that your character has reached the safe.

Variables

Here is a list of the main variables used throughout the program

180 NEXT N

B\$	=	NKEY\$.
A\$		The burglar
X	-	The burglar s X co-ordinate (vertical)
٧	=	The burglar's Y co-ordinate (horizontal)
И		Time in the house before the watchman comes round
A	_	Variable for a house position
S	_	Used in setting up the alarm pads
T	100	Used in setting up the alarm pads
M		Used in setting up the alarm pads
7\$	=	The house plan

10 REM BURGLARS BY ANCREU BRYD

15 REM PRINTS INSTRUCTIONS
20 PRINT AT 0,11, "BURGLARS"
30 PRINT AT 2,0, "YOU ARE A BUR
GLAR, AND YOU HAVE TO TRY TO STE
AL FROM A SAFE IN ARICH HOUSEHOL

31 PRINT "THERE WILL BE TAB
LES AND CHAIRS IN THE ROOM, ", "",
32 PRINT " ALSO, UNDER THE CAR
PET ARE SOME BURGLAR ALARM PADS
(""*").LUCKILYYOUR ACCOMPLICE
IN THE HOUSE WASABLE TO LOCATE
AND DEACTIVATE SOME, BUT NOT ALL
OF THE PADS."

33 PAINT "YOU ARE SHOWN AS ""D

34 PRINT "TO TAKE THE LOOT YOU
MUST LAND ON THE "","" BELOW T
HE SAFE"
35 PRINT "YOU HAVE A SET TIME
BEFORE THE WATCHHAN COMES ROUND

36 PRINT "

40 PRUSE 1000

DIM A (20,29) GOSUB 1000 59 G05UB 10 G0T0 200 51 LET 55 R事="D" X ≃ 9 Y=3 68 FOR N=1 TO 91 PRINT AT X.Y.As REM MORES SUSSIAN PROUNCE FO 70 75 90 RE.

100 PRINT AT 20 FT.

100 PRINT AT 20 FT.

115 PRINT AT X,Y," "

115 PRINT AT X,Y," "

116 LET 8 = INKEY \$

120 LET Y=Y - (8 \$ = "5") + (8 \$ = "8")

120 LET Y=Y - (8 \$ = "5") + (8 \$ = "8")

121 PRINT AT X,Y, R \$

122 PRINT AT X,Y, R \$

123 PRINT AT X,Y, R \$

124 PRINT AT X,Y, R \$

125 PRINT AT X,Y, R \$

126 PRINT AT X,Y, R \$

127 PRINT AT X,Y, R \$ 90 AT 20.0, "TO MOVE BURG FOR LEFT, 8 FOR RIGHT, 155 IF X≃4 AND Y=26 THEN GOTU 000 X=4 AND Y=24 OR X=6 AND X=8 AND Y=28 THEN GOTO IF X=6 AND 150 /=25 OR. ₹**©**@ IF A(X,Y) =7 THEN GOTO 1500 170

REM BET OF GARLAGUES

```
190
                                                    COTO
                                                    REM RETE UP OLASH DADE
             201
                                                    FAST
                                                                                     5=2 TO 17
T=4 TO 24
M=INT (RND*10+1)
             302
                                                    FOR
                                                   FOR
             210
            550
            230
                                                                                                                         THEN PRINT AT S.T.
                                                                               H>7
            240
                                                    TF
                                                                             M>9 THEN LET A(3,T)=7
                                                 NEXT
            250
           250
                                                 PRINT AT 9,9,"
           261
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
01.00
                                                    SLOW
           276
                                                   COTO
                                                                                                    66
                                                   STOP
  1999
                                                                                    EST UP BLAN OF Z$2"----UINDAL
                                                  REH
  1010
                                                                                                                                     ----かまれののから
esiline.
                                                   THEST
                                                                              A (
                                                                                E (
                                          ¥
                                                                                                                                                                                          22.50
                                                                                                                                                                                                                                                                     ROOQ-
```

```
1020
                              PRINT
                                                           AT 0,1,Z$
AT 6,28, **
    1025
                              PRINT
                              RETURN
                             REH INFORMING THE PLA.
SEEN CAUGHT
    1500
    1505
    1510
                              PRINT
                                                                                                          YOU HAVE"
                              PRINT
    1520
                                                                                                         BEEN CAUGHT"
AND GIVEN"
A LIFE"
    1530
                              PRINT
    1540
                             PRINT
    1550
                                                              4.1
                             PRINT
                                                                                                    SENTENCE"
                                                             100
.,"ANOTHER GO?
    1555
                             PAUSE
    1560
                             PRINT
   1570
                             INPUT
  1580
GOTO
                             IF
                                             B$ ()
                                                                                       AND BSGTN'
                                                                                                                                                         THEN
                                  1570
   1585
                                            B # = " N "
                                                                                  THEN
   1590
                                            Bs="Y"
                                                                                                             CLS
                                                                                  THEN
                            TE BEE THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE LONGER THE 
  1595
                                                                                  THEN
                                                                                                             GOTO
  2000
                                                                                                        THE PLAYE
                                                                                             COT
 2005
2010
                            CL
                            PRINT
                                                                                             YOU HAVE"
STOLEN"
THE CASH"
  5050
                            PRINT
                                                           4.0
  2030
                            PRINT
  2040
                           PAUSE
                                                            50
  2052
                           PRINT
                                                                             10,10,"<u>ComSPATUL</u>AT
                                                            AT
                           PAUSE
 2054
                          PRINT
                                                           AT
                                                                             18,0, "ANOTHER GO?
       (YZN)
                                                          BS
     055
                            INPUT
2050
                           IF
                                          B$ ()
                                                                                     AND B$ <> "N"
                                                                                                                                                      THEN
     SOTO
                                2055
                                          B$="N"
3062
                                                                                THEN
                                                                                                            STOP
                          IF
IF
                                          B#="\\\"
                                                                                THEN
2070
2075
                                          B$="Y"
                                                                                                            GOTO
3939
```



FOR SPECTRUM Star Treit 488 Sea if you can rid the galaxy of the awil Kingons, save the Federation from the treacherous Romulans, race to protect your star bases from anack. Are you star-ship commander materia? ONLY (4.95 Spectipede 168 Sea how long you can keep the Spectipede at bay as they decend upon you. You'll have the help of poison mushrooms and your guin

memory and the One graphics. For 1 to 6 players if got isn't your game try the other games in our range

terum Golf 18K Similar to ZX81 Golf but utilizing the Spectrum colour graphics and sound

One Goff 48K A Further development of Spectrum Doll Initizing 48K of mannets and the One graphics For 1 to 6 players

DNLY 07.95

Dept. 2x 2 34 Bourton Road, Tuffley, Gloucester, GL4 0LE Tel (0452) 502819

Orio Outzemaster 488. A menu driven quiz game utilizing and colour instructions are also given to substitute your questions and answers. Great fun for all the lamily and ideal?

General knowledge rock and pop

Quizzmaster 3 Dut soon ONLY C7 95 bach which includes a £2.00 discou youther for your new Quizzmaster

Further Quizzmanters to follow

MEN PRODUCTH Extend your 16k pectrum to 48k for just£23.00. And get a Free program worth£4:50 into the Is the manual part chapter 24 a mystery to you? Beyond Horizons' shows 46K Spectrum users how to PEEK and POKE systems variables, how to manipulate the display lile, how to control the attributes, how to find out how much spare memory is left and much much more. With the SP48 this program is free. On its own, £4.50.

SP48, 32K Memory Extension with Program — £23.00

Now run of 48 lifters even bonk, value

HEN

Ü7

HEN

984

Because now well a linky intering you the facility to up-plade your 16k. Specture (48k who classic classic) which he appointment to be able to ill like his vasify the independent my south land classic.

Fire \$23 all you need the same in this section the sock that a viriated by tend or the sock that a viriated by tend or the sock that a viriated by the viriated by the viriated by the viriated by the viriated by the viriated by the viriated by the viriate

Page 50 Still war at 10 Still A vicus at 10 years of 20 Still A vicus at 10 Still A vi

Then all virunned lead in the API is specially will for 48K grade uniquant. Beyond duritions and viril 48K crimplate will gallet you through is memory will had read about though it areas into will save you in a because we at know how easy this eight rist with remote maps.

SP80 Paged Memory Extension — £46

This ingenitus device gives a 16K Sper in who memory banks or taking in and amassive rotal it PRK. RAM in an be used as a standard 48K matchine bulls auges as be switched by service in the insertions within your prograt. The SPAC is not observed to latitude begin to include seed with 48-86 FOAT 4.

Fitting power consumption and function and or comparishment dentical orthographic and Tas services or our promisers (3) by registered position

48/80 FORTH — £14.95

This now Frith Complier indirects the lates in been and most complete a lister of First FORTH for the Specific had been added as for which an BOK valence. Done little that an SPAB car bit will achieve and good or an SPAB.

RE FORTH years you has speed or the hard indicate the programming simple to the PASIC and soldies to you have they contact the Fuel's versions all the spectrum uses when years to you have a second a sell when a successful to the handling to the a second to sell when a successful to the handling to the a second to the



48_80 FORTH comes with a comprehensive user many all writing bith in tiple and edite.

ZX Slowloader — £10

This classic piece of software loads ZXB_BASIL_prog a classifier 49% scaled in 6 your Spectronic early 16 SAVE againd FDI Ting it can do not few minimal who would normally lake weeks of keyboard. The

	raducts on his distributionate in stock as he sincip gorbuits press Sail se
	alch or phoned Access and visa orders
1 7 5	asicondon Robotica cid. Preaso sind อัง 🕒 มากาเหมายาร 🗦 มากา
[]	SP48 4506 FE35 5500 2
Ħ	SHALL SSUE [5] SUITE APP
H	
	TE WE CADER (
	BEY NO HORZENS program Extra
\Box	48 80 F H H [4 95
Done	The Defendance of Assessing to the Asses
PITE	rage 0.65p 1 enclose a meque Provin My Access s sa Ni
ГТ	
-	
Mar	
	r _i C
Add	ne tess
Add	
	ress
t as	ress i unndom Hilbrius Lidi Gate - Roya Arbeit vock London Elb
tas	ress London Hilbrins Lid Gate Roya Arbeit wick London Elb
bas a H Total	ress London Hilbrick Ltd. Gate - Roya Arbeit wick London Elb Grandon activit EAST LONDON London activity - EAST LONDON
bas a H Total a H	Trens To Charles the second state of the seco
blas alb Total alb Total	ress London Hilbrick Ltd. Gate - Roya Arbeit wick London Elb Grandon activit EAST LONDON London activity - EAST LONDON

Sales report

A user-friendly sales records program for your Spectrum written by David Rands of Harlington.



Sales Report is a menu driven program which was written to keep records of individual sales. results on a weekly basis over the period of a year

The main features available

- Record of weekly results for each employee during each month
- Summary of individual results by month
- Summary of individual results by year to date

A tota of 12 employees for departments areas shops, etc. are provided for and there is also provision for adding or deleting these during the year if all 12 addresses are in use and an

can be entered in the ex event the results of the exemployee are automatically transferred to a separate store and are reproduced in the mon-

each week and also on the last day of the month, so that five weeks, entries are provided for within each month.

designed to be user friendly and considerable use has been made of error trapping routines.

fit is desired to interupt the program during a run, it is important to continue by entering GOTO 400 which will ensure that the arrays are protected

Variables

Here to ows a st of the man variables used throughout the program

employee leaves, a new name employee's position in this

thly and year to date summaries Entries are made at the end of

The program has been

- * *SALES REPORT * * MAIN MENU
- 1 INITIATE REPORT
- 2 ALTER/ADD NAMES
- MAKE ENTRIES
- SUMMARISE MONTHS
- 5 SUMMARISE YEAR
- 6 SAVE REPORT

The initial MENU page you are greeted with

Program description

A line by line breakdown of the program to lows

Lines 5-70 Lines 100-250	Set up the months of the year
Lifes TOO-25Q	Dimension the main arrays Let the user set up the names of the employees
Lines 260 350	Enable user to correct any errors in the initial
	set up of the names of the employees
Lines 400-545 Lines 550-595	Main menu and choice routine
T 1:62 550 535	Protect the main arrays with a question
Lines 600 700	routine
	Enable the user to delete an existing name or add a name at a previously unused address
Lines 710 730	Transfer the monthly balance of extemp oyees sales to a new array
Lines 740 780	Delete ex employee's sales from a previous address position
cines 800 910	Enable the user to choose employee and
	month to commence entries
Lines 920 1050	Display the month iname and any balances
unes 1060 1100	against particular week number
Titles 1000 1100	The state of the s
L ne 1110	against which entries are to be made
2.10.11.0	If the user chooses a week where there is already a balance, the program jumps to me
	1150
unes 1120 1140	
Lines 1150-1180	Ar ow the user to have the opt on of deleting
	the balance or returning to the MENU
Lines 1190 1240	Balance is deleted and the display is cleared
	and reprinted Program returns to NPLT statement
Lines 1300 1340	The user chooses month to be summarised
Lines 1350 1410	The residus of current employees are displayed
Lines 1420-1480	The results of ex-emp oyees are displayed
Lines 1490 1520	The user has the option of summar sing other
	months or returning to the MENU
⊾ nes 1550-1590	The heading for the annual summary is
	d splayed
Lines 1600 1670	Calculate the year to date total for employees
	and ex employees
⊾ne 1660	When the first employee's results are
Lune 1710 1300	calculated this line nitiates a GO SUB routine
	Hat I be I by Chief Add Linear can be all

Lines 1710 1760 (GO SJB routine, Print results of each

400

Lines 1800 1850 SAVE and VERIFY routine Loads program and

m and n Used n oops

Week's balance, three dimensional array lemplayee month and week

Month's totals, two dimensional array temployee and

Month's totals for extemployees, two dimensional array

(employee and month)

Monthly total for a employees \mathbf{q} Monthly total for all ex-employees Annua tota for all employees Annua tota for allex employees

Temporary monthly total used in addition calculation Used n INPUT statements C employee D month and CDF WEEK

B\$ Months of the year 5\$ Employees hames

LŚ Stores a fine

q\$ Used in various INPUT statements employee as they are calculated. When all

employees, ex-employees and the grand total

variables, and will run automatically from line

results are known it then calculates and

displays the year to date result of current

RESULTS BY YEAR

	Name	Total Y.T.D
	LAURIE.K HARRIS.A SINGH.R JONES.T(MRS) DAVIS.A LITTLE.P EXPORT DIV.	9670 14077 12394 12310 1350 1150 120 100 100 100
1	Sub Total= Ex-Employees= TOTAL=	106828 5465

Press Any Key to Continue

The results of the verious selespeople throughout the year, complete with the total sales for the year

EMPLOYEE = SINGH . P

Month = MMY

t up

ai

O.F

ees

g

ite

31

95

١ė

а

nd

Results to be entered at 2000 end of each week & end of month

Week No.1= 690

Ucek No.2= 1400

Ueek No.3≃ 525

Week No.4= 200

Week No.5= 90

TOTAL = 2905

An individual report showing the sales made by one particular salesperson over a specified period

Month = JANUARY

1	LAURIE.K	0
123	HARRIS.A	2000
3	SINGM.R	2300
4	JONES . T (MRS)	
4 5	DAUIS.A	2333
6	LITTLE . P	2543
5	EXPORT DIV.	
8		en
8		Ø.
10		Ø.
11		0
10		Ž.

Sub Tota(= 16851

Ex-Employees= 3000

TOTAL = 19851

A page showing each salesperson a record throughout a particular

REM ###SALES REPORT### DIM B\$(12,9): REM MONTHS FOR n=1 TO 12 10

20 READ B\$(n) 30

40 NEXT D 50 DATA "JANUARY", "FEBRUARY", " MARCH", "APRIL", "MAY", "JUNE", "JUL

","AUGUST","SEPTEMBER","OCTOBER ,"NOVEMBER","DECEMBER" 60 LET L\$="_______

GO TO 400

100 REM ##INITIATE REPORT## CLS 110 20 PRINT AT 0,3,"ENTER NAMES 0 EMPLOYEES", AT 1,6;"(maximum 12 120 PRINT 130 PRINT L\$
140 DIM S\$(12,12).
150 DIM W(12,12,5) REM NAMES REM UEEKS B ALANCES DIM T(12,12). REM TOTALS DIM U(12,12). REM EX-EMPLOY 160 170 FES 10 260 220 INPUT "Anymore Entries? y/D 230 IF CODE q\$=78 OR CODE q\$=11 THEN GO TO 250 240 IF CODE q\$(>89 AND CODE q\$(121 THEN GO TO 220 250 GO TO 190 260 INPUT "Are Entries Correct? 24 121 260 INPUT "FILER Name of Salesp
260 INPUT "Enter name of Salesp
260 INPUT "Enters & spaces 300 INPUT 310 CLS 320 FOR FOR n=1 TO m-1 PRINT TAB 3; n, TAB 6; 5\$(n) TO_{a-1} 330 NEXT n GO TO 260 340 350 REM 400 **MAIN MENU** BORDER 410 55 420 CLS PRINT AT 0,6; "**SALES REPORT**", AT 1,9, "HAIN MENU" 430 PRINT AT 4,6; "1 INITIATE RE PORT 440 PRINT AT 7,6;"2 ALTER/ADD N AMES" 450 PRINT AT 10,6; "3 MAKE ENTRI 459 PRINT AT 13,6,"4 SUMMARISE YONTHS! 470 PRINT AT 16,6; "5 SUMMARISE 480 PRINT AT 19,6; "6 SAVE REPOR 490 INPUT FLASH 1; "ENTER CHOICE 1 to 6 ",C 500 IF C<1 OR C>6 THEN GO TO 49 3 510 CLS 520 525 IF C = 1THEN GO TO IF THEN GO TO 600 C = 2 IF C = 3TO 800 THEN

53Ø 535 GO TO ĪF C=4 THEN 1300 IF IF C=5 THEN GO TO 540 1550 545 1800

545 IF C-6 THEN GO TO 1800
550 REM **PROTECT ARRAYS**
560 PRINT AT 8,1, INK 1,"By ent
31ing (1) on MENU you", AT 9,1,"w
111 clear all existing records";
4T 12,5,"IS THIS CORRECT?", AT 14,
5,"Enter 'y' to proceed"; AT 16,
5,"Enter 'n' for MENU"
570 INPUT q\$
580 IF CODE q\$=78 OR CODE q\$=11
3 THEN GO TO 400

590 IF CODE q\$ (>89 AND CODE q\$ ()

```
> 121
         THEN GO TO 570
   595
         60
              TO 100
                **ALTER/ADD NAMES**
IT AT 0,3,"SALES STAFF"
   500
         REM
         PRINT AT 0,3,
PRINT L$
FOR n=1 TO 12
   510
   620
   630
         PRINT TAB 3; n; TAB 6; 5$(n)
   E40
         PRINT N
NEXT N
PRINT AT 16,2; INK 1,"To AL
IC ADD names enter"; AT 17,8,
OYEE number"; AT 19,2; "To re
   650
   660
 TER or
         to MENU press ENTER"
INPUT Z$
IF Z$="" THEN GO TO 400
  EMPLOYEE
 turn
   670
   680
   590
         LET R=VAL Zs
INPUT "Enter name of Salesp
   700
   ",5$(R)
            "(max 12 letters & spaces
 ខាត់ទីពួក
         FOR 8=1 TO 12
   720
         LET
               V(R,n) = T(R,n)
   730
         NEXT B
   740
         FOR
               M=1 TO 1
D=1 TO 5
              m = 1
                           12
   250
         FOR
   260
         LET
               W(R,m,n)=Ø: LET T(R,m)=
  770
         NEXT n
               D NEXT D
GO TO 610
**MAKE ENTRIES**
   780
         REM
  800
         PRINT AT 0,3, "SALES STAFF"
  810
  820
  830
                  :1 TO 12
TAB 3;n,TAB 6;5$(n)
         FOR n=1
  840
         PRINT
         NEXT
  85A
      PRINT AT 21,2; FLASH
"Enter Choice 1 to 12"
  860
                                           1;
                                                INK
  870
  380
         1F
             C (1 OR C)12 THEN GO TO 8
 70
  890 CLS
  900 INPUT "Enter Honth as
                                            a Num
 ber
        IF D<1 OR D>12 THEN GO TO
  910
20
  920 PRINT AT 0,3,"EMPLOYEE= ";5
$ (C)
  930 PRINT AT 2,3;"Month= ";B$(D
ŗ
 PRINT AT 4,1; "Results to be entered at the"; AT 5,1, "end of ach week & end of month" 950 PRINT Lt. PRINT
  940
ach
       LET m=1

FOR n=8 TO 16 STEP 2

PRINT AT n,3,"Week No.";m,"

INK 2,U(C,D,m)

LET m=m+1: NEVT n
  970
        LET
  980
  990
              B=B+1: NEXT
1000
        LET
        LET T(C,D) =0
FOR n=1 TO 5
1010
1020
1030
        LET | NEXT N NEXT N PRINT AT 18,7; "TOTAL = PRINT AT 18,7; "TOTAL = PRINT AT 18,7; "TOTAL = PRINT AT 1,T (C,D) ENTIRES? Y/N CODE q
        LET T (C,D) = W (C,D, n) +T (C,D)
1040
1050
                               "TOTAL= ";
                                                 IN
< 2,
1070
                    9$=78 DR CDDE 9$=11
   THEN GO TO 400
а
1080
        THEN GO TO 1050 AND CODE 450
 121
                 "Enter Week Number
1090
        INPUT
1100 IF F (1 OR F)5 THEN GO TO 10
1110
      IF U(C,D,F) >Ø THEN GO TO 11
                 "Enter Results":" (rou
1120
       INPUT
                 the nearest £) "; U(C)
nded up to
),F)
1130 BEEP .15,20

1140 GO TO 970

1150 PRINT AT 19,1, INK 1,"There

is already a balance on";AT 20,

"WEEK "F," Enter '0' to clear

";AT 21,1;" balance.Press ENTER
```

```
INPUT Z$
IF Z$="" THEN GD TO 400
IF CODE Z$<>48 THEN GD TO 1
  1160
  1170
  1180
  240
         LET W(C,D,F) =0
FOR M-8 TO 18 STEP
FOR n=19 TO 21
  1190
  1200
        FOR n=19 TO 21
PRINT AT #,14,
REM 16 SPACES
PRINT AT n,0,"
  1210
  1220
 1230
                                    REM 31 SPA
 TES
  1240 NEXT n
 1300 REH #*5UMMARISE MONTHS#*
 1310 LET
1320 CLS
                 PRINT AT 0,2; "RESULTS
   BY
       HONTH"
 1330 INPUT
                 "Enter Month as a Num
 SCF
         ÍF
            D (1 OR D)12 THEN GO TO
 1 340
   30
  350
                  '"Month= ",B$(D)
         PRINT
        PRINT LA
 1360
  370
        FOR n=1
                     TO
                          12
        PRINT TAB 3; n.
 1380
                 TAB 3;ñ, TAB 6;5≰(n);T
     18,
TET
 96
        LET P-P+T(n,D)
NEXT n
PRINT 'TAB 7,"50b Total= ",
 1390
 1400
 1410
   INK
        2,P
LET 0=0
 1420
        FOR n=1 TO 12
LET 0=0+V(n,0)
 1440
 1450 NEXT n
1460 PRINT 'TAB 4,"Ex-Employees=
 1470 LET P=P+0
 1480 PRINT TAB 11, "TOTAL = ", IN
1490 INPUT "Summarise Other Mon
ths? V/D " of
                                                IN
 ths?
   THEN GO TO 400
 1500
1510
            CODE 9$ ()89 AND CODE 9$
        THEN GO
  121
      GO TO 1300
REH **SUMMARISE YEAR**
CLS PRINT AT 0,3; "RESULTS
YEAR"
1520
1550
 1560
8Y
1570
1580
       PRINT LS
        PRINT AT 3,3, "Name", AT 3,16
PRINT L
   Total
1590
        LET X=0
DIM Z(12)
1600
                     LET U=0
1610
1620
        FOR M=1 TO 12
FOR N=1 TO 12
1530
1640
              Z(m)=Z(m)+T(m,n)
        LET
        LET U=U+V(m,n)
1650
       IF n=12 THEN GO SUB 1710
NEXT n NEXT m
PRINT AT 21,3, "Press Any Ke Continue"
1660
        IF
1670
1680
   to
1590
1700
        PAUSE
                0
        GO TO 400
       PRINT TAB 3,5$(m), TAB 16;
1710
MK_2; Z(n)
1720
       LET
             X=X+Z(m)
1730
           M=12 THEN PRINT TAB 5; "S
       IF
15 Total " INK 2; X TAB 2; "E
1740 IF m=12 THEN PRINT TAB 2; "E
x-Employees= ", INK 2; U: LET X=X
1750 IF m = 12 THEN PRINT TAB 9, "T
DTAL = ", IN
1760 RETURN
       REM **SAVE
1800
                        REPORT##
"SalesR" LINE 40
1810
       CLS
                 SAVE.
1820 PRINT AT 10,0; INK 1; "REWIN

2, then any key to VERIFY"

1830 PRUSE 0. VERIFY "salesR"

1840 CLS : PRINT AT 10,3; INK 1,

"SALES REPORT VERIFIED"
1840 CLS PR
1850 STOP
```

The ZX81 soft Selection



ZX81/TS 1000 Programs for Young Programmers — Linda Hurley and Stuart Nicholls

PFI

EN

រភា

11

18

I

5

984

Programming for Young Programmers is a very we produced book containing some 40 programs for the complete beginner. It is complemented by a cassette containing some additional games and extended listings for six of the programs in the book.

Taking the book first. This really is for the novice and assumes absolutely no knowledge of computing or the BASIC language. The only part of the Sinclair manual which needs to be read are the setting up instructions.

The book will be particularly useful as a means of familiansing the young user with the 2X81 keyboard Programs are in the main short they all fit easily into 1K, and are clearly set out with colours used effectively to high ght the Shift Graphics keys Special Keyboard maps' are used to assist in locating keys the first time they are encountered

The programs are all very good Some of them are only a few lines long and the user is able to run some effective and absorbing programs immediately with the minimum of keying-in Just right for the young beginner. The book follows a logical sequence.

In which Nick Pearce scrutinises the latest software packages for the ZX1.

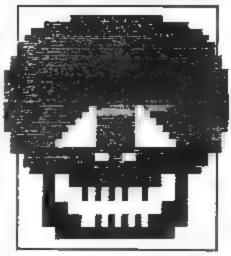
starting with programs which man pulate and display words through drawing with the computer and picture displays and on to movement and games. There is even a 'heip' section at the end to aid fault finding of the user slown initial programming attempts.

The book contains a host of good ideas for the budding programmer a though there is little in the way of explanation of how the programs work. The cassette takes things a little further and leads on to the Sinc air manual and more advanced studies.

The author has struck the right balance with this book which is key to prove a favour te and a valuable teaching aid.

The cassette contains a good range of programs 'Bomber' and 'Mazer' are both 1K games written entirely machine code Bomber' siparticularly good you have to obliterate the city before you crash into any of its buildings

and compares well with 16K versions on the market 'Mazer is a maze game in which you are chased by five ghosts, you score each time your character moves and the



object is to avoid being cap tured for as long as possible

'Golums is a board adventure type game which performs well a though the action is rather slow it is written almost entirely in BASIC and sizedily LISTed with the intention of introducing the user to the rudiments of computer gaming REM statements are liberally dispersed throughout the listing to guide the user through the program. An eight page booklet provided with the cassette contains an explanation of some aspects of the 'Golums listing'.

The remaining six programs extend some of the listings given in the book and each requires a little more than 1K. The booklet draws attention to some of the essons which can be learnt from the istings and indicates ways in which they might be extended and enhanced.

The book and cassette together provide a very useful learning package and are highly commended. They will undoubtedly be a source of ideas and inspiration for many young ZX81 (and TS 1000) owners.

The book and cassette are published by McGraw Hill Book Co (UK) Ltd, Shoppenhangers Road, Maidenhead, Berkshire

City Patrol/Saboteur — Macronics

City Patro is a superbilling speed action game set in a futuristic city which you have to defend from alien suicide ships.

The moving screen display is first class. The city consists of four streets of skyscraper blocks giving a 3D effect and udicious use of the control keys allows you to move slowly, or at breakneck speed in either direction as you search out the aliens. They are tan tails ngly difficult to capture as they pass behind buildings and

30

descend to ground level if they reach the ground, their miss on is accomplished and they set off a series of explosions which can destroy a arge por tion of your beloved city There is a scoring system, but a was usually too absorbed in chasing the aliens to worry about my score - more often then not it seemed to be negative Alt n all, 'City Patrol is a very impressive game

'Saboteur is another novel game from Macronics for the ZX81, but not in my op nion as absorbing as City Patro! Nevertheless it is based on a good idea and runs faultless y

n this game the screen represents a plan of a compound containing randomly placed boxes of ammunition You can either be the guard, who has to protect the ammunition, or the saboteur who must blow up as much of t as he she can, with the computer taking the opposing character

Your character s moved around the compound in the usual way if you are the saboteur, you must find a suitable place to plant your charge and retreat a safe distance before it explodes if you opt to take the role of the guard, you can adopt one of two alternative strategies, try and guess where the saboteur will go and get there first or attempt to trap the saboteur in a coroer

Both City Patrol and 'Saboteur are written largely n machine code but the programs can be LISTed indeed the parameters of Saboteur can be a tered using POKE commands to make the game more difficult I must admit found it hard enough as it was

Both games require 16K of RAM

These Macronics cassettes are attractively boxed and wellpresented with full instructions on the cassette insert cards.

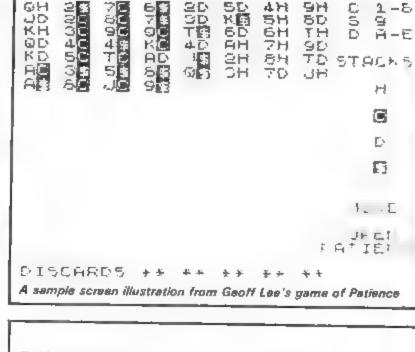
City Patrol and Saboteur cost £5 00 each from Macronics Systems Ltd, 26 Spiers Close. Solihull, West Knowle. Midlands

Stones/Open Patience - Geoff Lee

'Stones s a board game which has the potenta to drive you to utter despair as you try to anticipate where your final stone will land. The board which is displayed on screen throughout each game consists of eight pairs of cups your's lined up against your opponent s At the start each cup contains an equal number of stones ,from one not too hard on the grey matter - to SIX impossible). To move you specify one of the pairs of cups, the stones in that cup are taken out and distributed one at a time in cups going an ticlockwise around the board

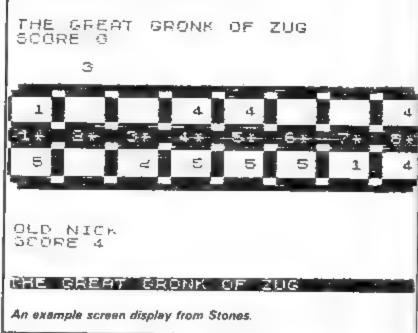
To score your last stone has to land in an empty cup and you score points equivalent to the number of stones in your opponent a cup opposite that empty cup otherwise movement around the board continues with your last stone plus those in the cupyour last stone reached being distributed anticlockwise, and so on

You can play against a human opponent or against the computer (playing as the



5H

ರರ



'Great Gronk' or Zig' or 'Jeremy the Jiving Giraffe' or some such other unlikely character) Luckily, the computer does not seem to well up on strategy and is readily beaten providing you play with only a few stones in each cup so as not to confuse yourself unduly

The ZX81 keeps score perfectly indeed this game is well suited to a computer lit could be very difficult to keep track of moves and scores otherwise Not so with Open Patience' on the B side of this cassette. This is a simulation of the card game of that name which I think I would prefer to play with a real pack of cards The display is good, but why play a game such as this using a computer except maybe to prevent cheating? Technically, the game performed well and does not permit legal moves

The pack of cards is displayed laid out face up wards in eight columns. The

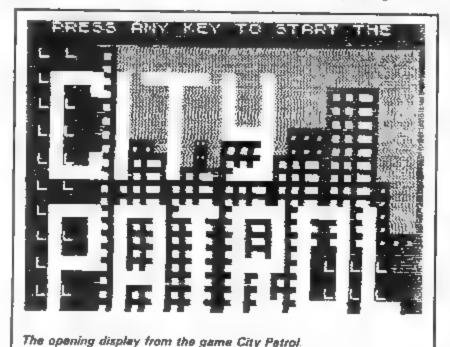
object is to get the cards onto the suit stacks in ascending order. You can select either four or five discard stacks. The lack of playing card figures in the ZX81 character set is as always a disadvantage in card game simulations but ! had no problems reading the display notation adopted by Geoff Lee

Bot games worked well and had adequate on screen instructions. They require 16k RAM and take about six minutes to LOAD

Stones and Open Patience costs £4.50 from Geoff Lee 5 Westbourne Road, Islington, London N7

Eights - Hardy Software

Also a card game Eights is dentical to the traditional game of the same name in which your opponent is the



ZX81 The computer displays and manipulates the cards and keeps both scores

A-E

285

. [

nce.

4

ds onto

ending either

t s as

had no

d splay

ff Lee

ell and

en in

e 16K it six

tience

Lee, 5

ngton,

vare

its' s

itional me in

s the

Y 1984

t is a game in which strategy is important. The program is apparently based on algorithms or ginally developed for a TRS 80 is this biasphemy? version of the game, whatever it sicertainly hard to beat. The computer has an advantage of course its electronic memory can remember the played cards much more read y than the humble human. As expected, the program obeys all the rules of Eights and will not countenance cheating. The program is long and uses most of the expanded ZX81 s RAM

Eights costs £4.95 and is available from Hardy Soft ware 18 Velindre Place, Whitchurch Cardiff CF4 2AN

Tarot — MP Software

Tarot by MP Software is a self-contained tarot reade in tended to enable the user to receive enlightenment using this ancient method of fortune

YOUR HOPES SHO FERRE

THE WHEEL OF FIRENE CHAMBEL WELL

ELEMENT - LATER TEN OF CUPS HUNGR: HAPRINESS.

E EMENT - FIRE FAGT OF BATONS TEATEL, NEW HOME.

FRESS NEWLINE TO CONT FEARING

What do the bits and bytes have in store for you — check out the Tarot package from MP Software.

telling For the unin tiated, the tarot uses a pack of 78 cards made up of two sections, known as the major and minor 'arcanas'. The major arcana is similar to an ordinary pack of playing cards with four suits named wands, cups swords and pentacles with an extra card, the page, in each suit. The pack is shuffled and deat out face down in an arrangement known as a 'lay'. The cards are revealed and from

their position and meanings interpretations are made which are intended to enlighten the user on aspects of his or her problem or query.

MP's simulation is written in BASIC and takes a attle over four minutes to LOAD. To start, brief instructions explaining how to use the program are given on screen. A reading is given under seven separate headings, the state of mind and body, home life.

etc, each comprising three cards together with their interpretation.

To benefit from a reading it is important to have a specific problem in mind and to concentrate on that problem as the reading continues. Whether treads to a solution will depend on how seriously you take the taret as a form of psychology, and whether you believe your state of mind can influence the random selection of a computer. Some of the mysticism of the tarot may be ost by having readings readily available on your ZX81.

Tarot has apparently been written with the aid of a practising Mag. Indeed MP Soft ware claim the authort is descended from an 18th century mystic. William Blake For fill one is entitled to a high level of "expert input a though at that high price this cassette is likely to appeal more to the already en ightened tarot user than the interested ZX81 owner I cannot see it converting many sceptions.

Tarot costs £15 from MP Soft ware 3 Pine View Close, Hasiemere, Surrey GU2 7 1DU.

COMPUSOUND 84

"THE ONLY ONE OF ITS KIND TO FIT INSIDE THE SPECTRUM"

Probably the worlds smallest modulator!

TELESOUND 84 is ready built and tested to get to Specifican sound through your unmodified television set black white or colour. The usur can be itted in minutes without any previous experience. Telesound 84 has been developed using the very atest ultral minutature components so that the size is kept to an absolute minimum.

TELESOUND 84 FEATURES

Sound and vision together for added realism. Beep volume controllable from a whisper ip a roar. Keyboard prompt click clearly heald blassist program entry. Programs can be heard with loaded. Compatible with a lother ZX add ons. No spidering or tase full rig required. Additional amplifier not necessary.
 Separate power supply not required.

TELESOUND 84 comes with full fitting instructions and costs £9.95 inclusive of past packing etc. Please state your computer when ordering







BOOKS GAMES SMA. BASIC AND MACH NE

COMPUSOUND Dept ZX 32/33 Langley Close, Redditch,

Worcs B98 0ET

Tel@527) 21429 21439

ZX COMPUTING DECEMBER 1983/JANUARY 1984

BUFFER

MICRO SHOP

310 STREATHAM HIGH ROAD, LONDON SW16 6HG Tel: 01-769 2887

We Don't Need
To Advertise
We only booked this space to annoy our competitors

P.S. Software gift voucher now evadable

RE AND ACCESSOR ES L'GHT PENS TRACERS SOUND BOXES

VISA ACCESS - AMERICAN EXPRESS DINERS CLUB
Open Tues Sat 10:30 am in 5:30 pm closed Monday)

6

THE REVOLUTION **IS HER** A new and incredible extension

RICHARD TAYLOR

to basic that lets you write fast moving **Arcade games**

*FIFTH has the following NEW Commands & functions

All, Attr, Break Key Disable, Colours, Column, Current Direction, Disable, Enable, Erase, Fill, Find, Get Interact. Intparam, Jumps, Large, Let, Limit, Line, LMTPARAM, Mask, More, No, Object, Print, Put, Replace Rmove, Screen, Sound, Speed, Status, Temps Use, Vector, Velocity,

*Personal Computer News said:

"Fifth provides an excellent set of commands for programming arcade type games and makes it easy for you to write fast moving games in Basic."

The packages come with an extensive manual, a demonstration program and the fifth interpreter. The commands are entered as words into your program and give you INTERRUPT driven, fast, high resolution SPRITE graphics without losing the simplicity of Basic.

Buy FIFTH and get a City Bomber FREE!

Just type in this program by Richard Taylor with your Fifth Interpreter

REH & BUMBER
REH & BY RICHARD TAYLOR &
REH & BY RICHARD TAYLOR &
REH & BY RICHARD TAYLOR &
REH & BY RICHARD TAYLOR &
REH & BY RICHARD TAYLOR &
REH & BY RICHARD TAYLOR &
RANDOMIZE 1888
RANDOMIZE 1888
RANDOMIZE BORDER &
OUER & INVERSE & FLASH &
BRIGHT & INK & PAPER 7 60 [.5] 76 GO 5JB 9000 89 GO 5JB B000 90 LET MI=8 LET X=\$ LET \$007 THE LET TELL CONTROL OF THE SCOTE OF THE SCOTE S 1826 REM RLL BOOK HOVE BOOK, 3, 6 1838 REM ENABLE BOOK 1848 REM MOVE FRANCE & NEMADLE E GE LEVE T PRIM' INC. 1.

MEN LEVE T [9:0]

THEN C THEN 00 TO 12 1238 IF INKEYS: DOR INKEYS: N
1238 IF INKEYS: WAND INKEYS:
1238 IF INKEYS: WAND INKEYS:
1448 INPUT New Leve T Lavel
1258 IF Level & OR Leve. >2 OR Leve.
1558 IF Level & OR Leve. >2 OR Leve.
1558 IF Level & OR Leve. >2 OR Leve.
1558 IF Level & OR Leve. >2 OR Leve.
1558 IF Level & OR Leve. >2 OR Leve.
1558 INPUT INKEYS PRINT RB. FLA
1558 IMPUT INKEYS PRINT RB. FLA THÊN GO TO 15 1516 IP INKEYS THEN LET SOLOGO LET ZET BOT THEN LET SCOLOGO LET ZET BOT THEN LET SCOLOGO LET ZET BOT THEN GO TO TOWNEY BOT THEN GO TOWNEY BOT THE OR INKEY .- Y" *50 (L5 abod LET *=0 CE7 y=0 REM TEMP5 LANGE LAN

2825 PRINT AT 0.26, Score, 2830 IF y 28 THEN LET y=20 = 232 IF y 166 THEN LET y=168 2835 REH HOVE PLANE, COLUMN Plane 2040 IF 447 P THEN RETURN 2050 REM 155 BOBB, 2 2050 LET 2=2+1 IF 104 THEN LET ab70 REH LET BELINE PLONENLET DE COLUMN PLONENLET CALINE BOBB 2075 IF CO170 THEN RETURN 2000 LET BEACH LET CALINT LICE 41 017 324 CLESO) REM MOVE BOBB 2000 RETURN
3000 FOR 2-2 TO 31 LET BOINT IR
ND 130) +1 IF AND 1.0 THEN GO TO 3
3010 LET d=INT RND 45 FOR (221
TO 21 B STEP 1
7020 PRINT AT (2, IMA d BRIGHT
RND, B BEEP .085 (205 NEXT 1
1030 PRINT AT (1, IMA d
1030 PRINT AT (1, IMA d
1040 NEXT 1
1040 NEXT 1
1040 REM LATPRARM
4010 JF Ha + P 474 THEN GO TO 52 ABID JF has pare THEN DO TO BE 300 IF has enemy THEN GO TO 45 ABID IF has enemy THEN GO TO 45 ABID IF DELLAR HALL SE HAR. PARE COLUMN HA. ENABLE hall se har. Para continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue toma representation of the continue to the continu SESS LET CLO ENSCO E 1 PRINT AT B 26.3(0 E. SO4B BEEP BB5.60 CONTINUE SEON LET 1=176 LET 5=0 REH HOU P Plane, b.a. ENABLE Plane. Plane, D, alternoles, b, a EMABLE E
75510 REM HOVE FRENC, b, a EMABLE E
7689
5520 REM ALL BOMP MIVE BOMP, b a
5520 REM ALL BOMP MIVE LANDED
55300 POKE 23601.0 AVE LANDED
55500 LET #*2 LET T*1 LET ***
25500 LET #*2 LET T*1 LET ***
25500 LET #*2 LET T*1 LET ***
25500 REM 1NT 1NK 2, REM LARGE
25570 GO 10 1000
6000 REM 1NTPARRM
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000
6010 PO 10 1000 270 LET SCORESSCORE OF THE VELOVE OF PRINT AT 8,26, SCORE
PRINT AT 8,26, SCORE
TO CONTINUE
TO CONTINUE
TO SO REH HOVE ENERY.CO
LUMN ENERY O SENABLE ENERY.CO
LUMN ENERY O SENABLE ENERY
TO BE LET PEURRENT BOBBLUSE
SOBBLI HOVE SOBB COLUMN BOBBLOSE
NAME BOBBLUSE BOBBLOSE
BOBBLOSE BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBLOSE
BOBBL

3838 REM LARGE
5848 PLOT 8,108 DRAW 288,0
8858 LET 4 = 8 LET 4 = 2
8868 LET 4 = 8 LET 4 = 2
5868 REM TEMPS LARGE
5899 PLOT 8 8 DRAW 255,8
9188 DRAW 8 175 DRAW 255,8
9188 DRAW 8 175 DRAW 255,8
9198 DRAW 8 175 DRAW 255,8
9119 DRAW 8 175 LET 4 = 3
9128 LET 4 = 5 LET X = 8
2130 LET 7 = 35 LET X = 8
2130 LET 7 = 35 LET X = 8
2130 LET 1 = 2 LET W = 1
2148 PRINT INK 2, ASM LARGE
5158 LET 1 = 2 LET W = 1
5158 LET 1 = 3 LET W = 1
5178 LET 1 = 5 LET X = 5
6178 LET 1 = 5 LET X = 5
6178 LET 1 = 5 LET X = 5
6178 LET 3 = 8 PICHARD TAYLOR
6108 PRINT AT 12,5, Key 7 10 ECV
6 UP
6208 PRINT AT 14 5, Key 7 10 ECV C UP 8218 PRINT RT 15,5, Key & to dru P a bomb B220 PRINT AT 18,3 for must c ear a path to ,AT 19 3 land on .3230 LET a = 3 REM DBUECT Bobb, a 2240 LET a = 1 REM OBJECT Plane a 2250 REM DBUECT Entby, a 3260 REM PRINT Bobb, a 5270 REM PRINT Plane, as PRINT Enc NO DE COLOUR DE APINT INK 2 REM COLOUR DE ABORT PRINT INK 2 8130 PRINT INK 1, REH COLOUR EN 376 FOR (3 TO 13 STEP 10 3360 FOR 4 80 TO 500 STEP 10 3360 FOR 4 80 TO 500 STEP 10 3460 REM 30UND 5 t d s 6460 PRUSE 100 STEP 2 12 SEEP 2 10 SEEP 2 12 SEEP 2 12 SEEP 2 15 SEEP 2 5 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SEEP 2 5 SEEP 2 7 SE 2450 INK 9 PRIN, PHICK = 1701.7 =0, INK 0 REM REPLACE 3470 LET 5=40 LET cos LET dos LET 6=90.0 3450 REM 50UND 5.0, d cos 3450 NEXT A PAPER 7 INK 0 5500 LET de Plus any ley to continue 3510 PRINT 10 RT 1 0 BRIGHT 1, a 528 PAUSE 5 LET #6+#612 TO 1+# 1 INKEYES THEN GO TO 851 COSAB CLS

d5548 CLS

d5569 PRINT AT 17 @ FLASH 1 BRI

d77 I SELECT LEVEL

d5569 PRINT 1 Medica

2570 PRINT 2 Mard

1578 PRINT 2 Mard

1589 PRINT 2 Mard

1589 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 2 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

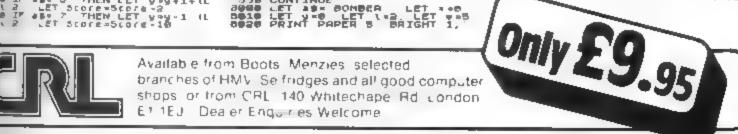
1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3 Mard

1598 PRINT 3600 INP, T P 4818 Select ", Leve 3618 IF , avet (# OR Level)3 OR Le 12 1 INT , try THEN GO TO 6698 3618 RET LAN 3618 RET LAN 3618 ACT LAN 3618 DATA & \$,0,2,56,124,124,56 3618 DATA & \$,0,2,56,124,124,56 3618 DATA & \$,0,2,56,124,124,56 3618 DATA & \$,0,2,56,124,124,56 3618 DATA & \$,0,2,56,124,124,56 3618 DATA & \$,0,2,56,125,153,153,255 3618 DATA & \$62,126,255,255,153,153,255 3618 DATA & \$249 35 255,255,153,153,265 9090 PATA & 0,159,196,255,258,4, 2300 SAVE BODDEF LINE 9990 SA E D414 CODE 61036,4335 9990 CLERA 61020 LOAD "CODE 2999 RUN Just an example of the power of

FIFTH CRL 140 Whitechapel Rd. LONDON E1 1EJ.





)mype

l to

ive

and

are

am ast, ith-

Sinclair On Television



sooner had excitement of the long awaited ZX Microdrives died down, but Sir Clive unveils one of his other long standing projects - the flat-screen television

The Sinciair 2" flat screen television incorporating just a single chip was introduced to a 'suspecting' public following a six year, £4 million development programme million Priced at £79 95, the package is just slightly smaller than the average paperback book, measuring 5%" by 3½" by 1¼1, and weighs in at 9½ ounces

Featuring high quality video reception and extremely low power consumption, the flat screen television includes only two controls on off volume and tuner. A special Polaroid. battery provides power for up to 15 hours of viewing It has also been designed so that t can be used in most countries. around the world - one of the

notable exceptions to this standard s the UHF transmissions from France

There are two key design features which make the Sinclair flat-screen television possible the first being the cathode ray tube (CRT). The CRT provides up to three times the brightness luses between one quarter and one tenth the power and by positioning the electron gun to the side and not the rear, eliminates most of the depth of a conventional CRT. Manufacture of the tube. s subcontracted to the Timex facility in Dundee

The other amazıng breakthrough has been the single integrated circuit designed by Sinc air Research and Ferranti Ltd, which handles a most all of the circuitry requirements Employing Ferranti s extremely advanced FAB2 CD process, the IC uses innovative digital techniques to monitor automatically video and audio

inputs and to adjust the receiver circuitry for local broadcast standards

Specia features of the IC include integrated sound selectivity, video innovations to eliminate image problems in the UHF channel and an advanced synthesised scan generator to control the complex waveforms needed to scan the flat CRT It runs a check 50 times a second to ensure picture hold

Sinclair Research have also designed a specially sensitive tuner, with up to 90% power savings

The teevision will be available at first only by mail order Sinclair Research have already made the announcements that initial stocks will be imited, but as production builds up they are hoping to soon manufacture 10,000 units per month, UK retai and export sales are expected to take place in the first half of 1984

Complete with foldaway aeriai, a personai earphone soft-carrying case and battery the new television is priced at £79 95 Polaroid 6V lithium batter es are avalabe seperately for a pack of three. and a mains adaptor will be Offered at £7 95

Said Sir Clive at the flat screen's press lunch "I believe t, and ts successors, can achieve for television what the transisitor radio did for wireless, and create a new one-person product" It could also be used for an on-board screen if one was thinking of producing a business computer which would need some kind of on board screen but enough of this ZX83 speculation

For more information on the flat-screen television, you can contact the TV Division Sinciair Research Limited Stanhope Road, Camberley Surrey GU15 3PS or 'phone 0276 62111



Second Edition

ZX Spectrum owners can now benefit from the interface 2 unit a new add-on from Sinciair Research which allows users to attach standard oysticks and fast-oading ROM cartridge software.

Priced at £19.95, ZX interface 2 plugs directly into the Spectrum's rear expansion port of the ZX interface 1 unit. The top of the interface 2 unit includes a 'porthole for ROM cartridges and two joystick ports accepting standard 9-way Diplugs. Everything needed to match joystick to Spectrum (and the software) is built into the interface 2. A so

once connected, the joysticks will work with either ROM cartridge software, cassette or ZX Microdrive programs. The unit also includes an expans on port at the rear so that the ZX Printer can be attached.

Complimenting the ZX Interface 2 unit, Sinclair Research have made available 10 programs on ROM cartridge, six of which were previously available on cassette in addition, the titles on ROM cartridge will work on the 16K computer as well as the 48K version even if the original programs were written in 48K.

Priced at £14.95 the sx

old programs released on ROM cartridge are Space Raiders Planetoids, Hungry Horace, Horace and the Spiders. Chess and Backgammon A further four programs are now available, culled from the software house Ultimate. Play The Game These are PSSST. Jet Pac, Cookie and Tranz Am.

The ZX Interface 2 unit and the ROM cartridge are in tially available by mall order only For further information, get in touch with Sinclair Research, Stanhope Road, Camberley, Surrey GJ15 3PS. Telephone enquiries can be made on

0276 685311

Six Of The Best

Sinciair Research have expanded tarange of software with six new cassette applications for the ZX Spectrum and ZX81

away

ttery

ed at

hrum

able

hree.

l be

flat

ileve

сап

t the

for

new

b uo:

oard

g of

1855

need

ard

this

the

can

DD

ted

rley,

one

1984

First up there are two programing and utility programs for the ZX Spectrum Both written by Crysta Computing, these are titled Monitor and Disassembler (for the 16 48Kr and Zeus Assembler (for the 48K Monitor modeli and Disassembler provides a powerful disassember so that you can translate code into comprehensive assembly anguage instruction. Thus, you will be able to examine the BASIC ROM in your Spectrum and also analyse your own machine code routines. The Monitor provides the user with an extensive set of facilities to aid the entry, inspection and debugging of your programs

The Zeus Assembler package has been designed to

simplify the process of producing machine code programs, enabling the user to write in assembly language instructions. Both packages are priced at £12.95

Sinclair Research have a so produced a package designed to frustrate in much the same way as the cube puzzles' have done. Their game, Flippt, ooks simple but involves the same kind of patience you need for the cube. In this game for your 16 48K. Spectrum you have to mandeuver nine 'Flippit' pieces, in search of the elusive magic square. Written by Lez Peranto, this cassette is priced at £9.95.

Of great interest to Sir Clive and other Mensa enthusiasts comes a package written by Victor Serebriak off, international President of Mensa called Cattell IQ Test Designed to operate on the 48K Spectrum, this program will calculate your Q

according to the Cattell Scall A test which is then timed, marked immediately and the marks standardised against your age. The package is priced at £12.95

Last for the ZX Spectrum comes an arcade game called Chequered Flag Written by Psion for the 48K computer this program puts you in the position of being a Formula One racing driver. With a choice of three different cars and 10 different circuits, you are in control of a whole bank of instruments. So, it is a case of keeping one eye on the road and one on the instrument panel flyou don't want to end up in a ditch! This program is available for £6 95

Only one new cassette is available for the ZX81 with 16K memory. Titled Mothership, the program offers a three dimensional space adventure. The package is priced at £4.95.

Profitting From Experience

Sinclair Research announced sharply increased profits before taxation and exceptions item of £14.03 milion for the year ended 31 March 1983. The company's turnover doubled to £54.53 million (last year it was £27.17 milion) and earnings per share were 207p against 106p previously.

Writing in Sincial's annual report company chairman, Clive Sinclair, called the figures encouraging, and noted that Sinclair's ZX Spectrum personal computer, introduced in 1982, "had become easily the best selling machine in the UK and in a number of overseas markets".

Attributing Sincar's strong position in the personal computer market to its technical and marketing leadership, he added that there remains much scope for innovation in the field and I believe we will continue to lead the world with future products

"Because we will never be free from competition we plan to introduce products in new market areas to expand the company and maintain our margins. In particular we expect to be eaders in the flat screen television field where we are confident that we have the best technology."

We wish Sir Clive well for the coming year is a how about the ZX83 then?

'Woolies' Move Into The Micro Market

In a major move into the micro market. Woolworth have become the largest chain to stock computers in the JK

160 n t ally over Woolworth stores will stock a wide range of micros, ncluding the ZX Spectrum, the Atari 600XL, the Commodore VIC 20 and the Commodore 64 A less extensive selection of home computers is to be marketed through other large Woolworth stores However, due to the popularity of the ZX Spectrum, you should be able to buy either the 18K or 48K version in no less than 500 branches of Woolworth

All the computers will be backed by a comprehensive range of games and educational software

Software In Brief

- Software Cottage is a software house producing programs with a definite musical bent. But you don't have to be a musical genius to be able to use them — all you need is a Spectrum or ZX811 For the Spectrum of X81! For the Spectrum, there are two packages titled Firework Music and Tuner, both written for either version of the Spectrum. Firework Music contains two programs, one each for the treble and bass clefs, and both help beginners learn and read note names. Tuner is a challenging game for the general user with a good musical ear. You have to tune notes correctly — in a similar way to tuning a guitar. There are also four cassettes for the ZX81 user. Firework Music, similar to the Spectrum version, Music Education 1, two programs to help the beginner learn note names in the treble and bass. clefs, Music Education 2, similar to ME 1 but for the alto and tenor clefs; and Music Education 3, which concentrates on rhythm and note time values. All the tapes are priced at £5, but if you buy three or more you only pay £4 per package. Further enquiries should be made to Software Cottage, 19 Westfield Drive, Loughborough, Leicester LE11 3QJ.
- Bug-Byte have, after some weeks of negotiation, signed a major distribution deal with the multinational CBS company. This will mean that distribution of Bug-Byte software will be eased in the words of Bug-Byte's John Philips "this deal means that whether the customer orders one tape or 10,000, the order can be processed and despatched within 48 hours. Furthermore, it represents an important step forward in our worldwide expansion plans". So, without too much emphasis on Bug-Byte's plans to take over the world, it means that if you're desperately trying to get hold of their amazing Manic Miner game for your Spectrum, you shouldn't have too much problem!
- If you're a ZX81 user and live in a rural area with no user club and you crave the kind of information and news you would normally gain from a club, why not check out the ZX Broadsheet. Offering informal contact by post with ZX81 users throughout the world and the UK, ZX Broadsheet also contains a number of programs and the new issue includes a beginners' took at machine code. So, if you're interested in broadening your programming experience or you'd just like to write to a fellow user in a far distant clime, you can find out more details on the ZX Broadsheet from Nick Godwin, 4 Hurkur Crescent, Eyemouth, Berwickshire TD14 5AP, Scotland. The price of each issue of ZX Broadsheet is 60p or four international reply coupons.
- As from 19 September 1983, Quest Micro Software will continue trading under the name of Fantasy Software. The new company will market all the software currently produced by Quest, mainly The Black Hole and Violent Universe all new software will bear the Fantasy Software label. It is the intention of Fantasy Software to publish a maximum of eight games a year. The first of these new packages is soon to be released and is called The Pyramid. Written for the 48K Spectrum, the price of the program will be £5.50. As yet, I don't know what the package will be about but watch these pages for more information. If you can't wait that long you can try getting information straight from the horse's mouth by 'phoning 0242 583661 or writing to the people at Fantasy Software, Fauconberg Lodge, 27A St Georges Road, Cheltenham, Gloucestershire GL50 3DT.
- From October, the program from Alan Firminger called ALL-SORT S-1 has been reduced in price to £9.95. Released in March 1982, this generator program gives machine code sorts for use in BASIC on a ZX Spectrum. The price reduction is possible because the expected high level of after-sales service was not required customers happily bought the product and managed to use the complex program without any problems. For more information on ALL SORT S-1, write to Alan Firminger, 171 Herne Hill, London SE24 9LR.

The Sky's The Limit?

Following the successful development of Bridge Software's Ephemeris program which was released for the ZX81 and Spectrum, comes a new soft ware package called The Night Sky.

For both the professional and amateur astronomer, this package for the 16/48K Spectrum is an observer's guide to the stars visible from the UK (from 48 degrees to 58 degrees North). Amongst its characteristics are features of over 700 stars, five magnitudes distinguished, 50 constellations identifiable and over four million different skyscapes, You can also COPY the skyscapes onto your ZX Printer.

You can use your Spectrum

to create brilliant H-res starcharts—a different one for every minute of every night of the year All you have to do is to input the month, date and time and a chart of the southern aspect of the sky will come up on the screen if you press the 'W', 'N' and 'E' keys you will get the starchart for the western, northern and eastern aspects on the screen respectively

he

W

st

ag

tr

al

fı.

e

ra

si ta p

Priced at £8.90 for the cassette and manua, The Night Sky is available from Bridge Software, 36 Fernwood, Marple Bridge, Stockport, Cheshire SK6 5BE You could always ask them for a catalogue of their ZX81 and Spectrum software they have a

great selection



On The Buses

Virgin Games have announced the first-ever computer games

tour - by bus.

Virgin Games have bought a double decker bus which has been completely refitted and furnished with 12 computers and screens comprising the ZX Spectrum Dragon 32, VIC 20, Oric, BBC Micro, Commodore 64 and TI 99/4A. There are plans to tour the bus to major towns from October to Christ mas giving youngsters (and oldsters!) the opportunity to see computers at work, playing games and the chance to meet some of Virgin's programmers in action.

Said Virgin Games' Manging Director, Nick Alexander "We were very pleased with the launch of the first Virgin Games titles, but we wanted to do something more innovative

this time. The bus would also be of general interest to people who haven't yet bought a computer, and were wondering what to do with it"

To coincide with the tour of the bus, Virgin Games are launching eight new computer programs, two of which are designed to run on the Spectrum computer. The two programs soon to be available from Virgin are Racing Manager and Lo,ix. There is also a free competition for purchasers of the new games to enter.

For more information on the prizes in the competition and the prices of the new software packages, contact Virgin Games, 61/63 Portobello Road, London W11 3DD Local user groups interested in a visit from the Virgin Games Bus should contact Angela Fitzgerald on 01 221 7535.

Spectrum Teacher The

A new range of educational software is available from Grif fen & George which should help your child tearn esential word and number skills.

e for

tht of

of alc

time

thern

ne up

s the

ll get

tern

pects

cas

Night

ndge

boor

port

ould

cata

pec

ve a

aise

0D €

ÖΜ

FPQ

ır of

are

uter

are

pec

pro

abie

cing

e is

pur

s to

the

and

vare

rg n

bac

user

V SIT

Bus

Fitz

984

Available from WH Smiths stores nationwide these packages wil run on the 48K Spectrum. All the programs use appropriate teaching methods aready used in schools and are produced and evaluated in full consultation with experienced primary teachers.

The first four titles in the new range include Wordspell, which is for children aged five years upwards. With 116 separate word tests each containing seven words this package provides a comprehensive introduction to the key rules of English spelling. The program can also be tailored to suit your own child's ability making it a very versatile teaching aid.

Getset is designed for chil-

dren of four years and upwards in this package there are two programs which introduce the idea of grouping objects into sets. Manipulation of objects should help the user to grasp the concept of addition and subtraction.

Numberfun is an addition and subtraction package for children of five years upwards. Displayed score rewards for correct answers and a range of choices within the programs make this package an effective learning and

learning aid.

The last package is called Tablesums and is designed to teach children of age six years and upwards. Using colourful displays, these two programs show how multiplication tables are easy to learn.

Priced at £7 99 you can find out more about these packages from Griffen & George 285 Ealing Road, Alperton Wembley Middlesex HA0 1HJ

The Game Lords

Quicksilve have come up with a very impressive new batch of software releases for the Spectrum which should be well into the shops for the Christmas rush

Perhaps their most impressive package to date is the first product to come from their software studios located somewhere in Hampshire' Written by Timegate author, John Hollis, the package is designed for the 48K Spectrum and is priced at £14.95

The package called Games Designer comes complete with eight games already programmed into it and it's up to you to change any aspect of them to suit your own tastes There are four game formats for the eight games. Invaders/ Galaxians. Defender/Scram ble, Asteroids and Beserk Having chosen the game you wish to play, you can then design your own animated gra phics characters such as aliens, ships missiles, explosions etc You can also alter the sound generation, scoring, movement control, moving background and attack wave design. In short, you have a smooth arcade quality series of games which when developed by the user, can include a limit less number of games.

The second package worthy of note in Quicksilva's new selection is 3D Ant Attack Priced at £6.95 and designed for the 48K Spectrum, this game involves you controlling a character walking around the walled city of Antescher. The walled city is shown on the screen as a number of solid 3D blocks which can be viewed from any angle as you move your figure around

in amongst the city, you will come across a number of roving Killer Ants which you should, of course, try to avoid. However, it must be said that the graph cs do rather detract from the game — because they are so good that you end up just looking at the graphics and ignore the fact that you are being eaten alive by the ants'

Quicksilva, on seeing the tape from the author Sandy

White are supposed to have been impressed that they fiew Sandy down from Scotland and signed contracts within 24 hours. Sandy White has applied for a patent for the graphics techniques used throughout the program.

Another game amongst the new releases is a definite 'fun' game Called Bugaboo (or The Flea), you play the part of a flea trapped down a colourful cave full of wild and exotic vegatation. The game is simple to play using only two keys and addictive to say the least! The game designed for the 48K Spectrum and priced at £6.95, uses Spanish software from Indescomp and has been written by Paco and Paco.

Quicks la are also marketing two other games they them selves describe as awesome. Written for the 16,48K Spectrum comes Gridrunner, the best-selling arcade game in the States, and for the 48K Spectrum traxx Both games, priced at £6.95 were designed by Jeff Minter of Llamasoft and programmed by Salamander Software.

Quicksilva have also launched the Game Lords Club for games and computer enthusiasts A £1 membership fee (redeemable against mail order purchase) will give members a regular C ub Fanzine, competitions, games at special prices, previews of games and, of course a selection of badges and T shirts

The address for direct mail order of Quicksilva goods is Quicksilva Mail Order, 55 Havilland Road Ferndown Industrial Estate Wimborne, Dorset BH21 7PY and the 'phone number is 0703 20169 For any other enquiries you could always write to Quicksilva at 13 Palmerston Road, Southampton, Hampshire SO1 1LL

New From Artic

Of the 21 programs Artic Computing have released, 15 of them are designed for the Spectrum and ZX81. So, with a choice like that, there must be something there for you!

There are five new packages for the ZX81 two of which are games and three moving into the educational world. The two games are Alpha Probe and Community Chest priced at £3.95 and £4.95 respectively. Alpha Probe involves you jetting around from planet to planet, exploring as you go, Community Chest is a 'Monopoly type game in which you have to pit your wits against the computer.

The three educational tapes are called Vocabulary Tutors. The languages the tapes are based on are French, German and Spanish and have been compiled by anguage teachers. The tapes are priced at £4.45 each or all three for £12.

Moving onto the Spectrum, there are 10 new packages for you to peruse all games except for one. Dealing the odd one out it is an educational tape for the 48K version and called A.B.C. Priced at £6.95 the program is targeted towards primary school children in the five to eight year old bracket. The child must press any key on the keyboard and an object beginning with that letter is drawn on the screen and the child is invited to spell.

the word

Of the remaining nine games, seven are designed to work on the 16/48K version of the Spectrum, These include Road Racers, a racing car game Spectra Probe, a Spectrum version of the Alpha Probe program released for the '81; Snake, in which you must guide a pet snake around a maze of poisoned mushrooms. Millimon, in which you must kill the Millimon and a host of other insects using your laser base, Reflections, in which you are trapped in a maze of mirrors. Reversi, a version of the popular board game in which you get to play the computer and Snooker, the pub game available now for the armchair atheiete These games are priced at £4.95 except for the last three mentioned which retail at £5.95

Two 48K games have also been released by Artic and these are St Andrews and Jigsaw Both priced at £5.95 the first package provides a thrilling game of golf reproducing all 18 holes on the old course of St Andrews, while the second program allows the user to put together two agsaw puzzles

For further information on Artic's new range of software you can write to Artic Computing Ltd, Main Street, Brandesburton, Driffield YO25 8HG. Telephone enquiries can be made on 0401 43553.

ZX COMPUTING DECEMBER 1983 JANUARY 1984



Naval manoeuvres



At enitor he by ZXB1, his version of Battleships involves you taking on the computer in a havail conflict.

in the swim

1984

As in the game, we all know and love, the idea of the game is to sink your opponent is fleet before they manage to sink yours.

When you first run the program the computer first provides you with a few brief in structions on how to play the game. When you are sure you understand the workings of the

A ZX81 version of the popular board game from MJ Downie of North Yorkshire.

game the computer sets up its feet on the right hand playing area. Once this has been done you posit on your own fleet.

You do this under instruction from the computer which invites you to give the co-ordinates of each ship in your fleet. You must position one battleship.

represented by four squares two cruisers (three squares three destroyers (two squares, and four submarines one square each. You position your fleet by first inputting the row colordinate followed by the column to ordinate on your 10 by 10 playing grid on the left hand.

part of tile screen

ng three shots at the computer sileet This is done in a similar manner to how you in putted your fleet in that the computer asks you first for the row co ordinate followed by the column co ordinate. The computer will then have three shots at your fleet and so on. All shots and hits are shown clearly on the screen, and the winner is the one who destroys the other's fleet first.

The player has the same chance of winning as the computer, so have fun!

```
14 E D
                  REM
                  O DOUNIE,
           REM
           REM
           CLS
        8
           CLEAR
       9
           GOSUB 7500
           FASI
      15
           G05U6
                     5000
          GOSUB 5500
GOSUB 7000
      18
      30
          GOSUB 1000
          LET HITP=0
LET HITM:0
LET PLR-0
LET MCN=0
     50
     51
     55 GOSUB 500
56 FOR U-18 TO 21
57 PRINT AT U.0,"
         FOR I=1 TO 5
NEXT I
PRINT AT U.0,"
     58
     59
     61
          NEXT B
          FOR U=1 TO 100
     70
     75
          NEXT
                  U
     90
          GOSUB 2000
         FOR F-18 TO 21
PRINT AT F.0; "
   100
         FOR I=1 TO 5
NEXT I
PRINT AT F.C,"
   107
   115 NEXT
   117
         COTO
 120 GOSUB 9000
160 PRINT AT 21,0, "HIT G FOR AN
OTHER,S TO STOP",
170 LET D$=INKEY$
 170 LET D$=1NKFY$
175 IF D$()"G" THEN GOTO 170
                            THEN IF D$40"5"
   180 IF D$="G" THEN GOTO 1
   500
         PRINT
                   AT 19,0; "ROUP 40, TEN
 501 FOR U=1 TO 3
505 LET PLR=PLR+1
  513 PRINT AT 21,0,"
LR, ".. FEED ROU", 520 INPUT O
  521 IF A=0 THEN LET A=10
522 IF A>10 THEN GOTO 515
523 PRINT AT 21,0,"
525 PRINT AT 21,0, "SHOT NO.
LR, ".. FEED COL",
527 INPUT B
  530 IF 8>10 THEN GOTO 525
         IF 8-0 THEN LET B-10
IF A$(A,B) - "X" THEN GOTO 51
  531
  533 PRINT AT 21,0."
                                  ...
535 IF A$ (A, B) ="*" THEN PRINT A
T 21.25, "MISSED",
536 IF A$ (A, B) <, "*' THEN IF A$,
A, B) <>"X" THEN LET HITP-HITP+1
537 IF A$ (A, B) <>"*" THEN IF A$ (
B, B) <>"X" THEN PRINT AT 21,25, "A
  538 FOR P≤1 TO 20
 538 FUR F=1
539 NEXT P
540 IF A$(A,B) ="B" THEN PRINT A
2+A,19+B, "B",
545 IF A$(A,B) = "C" THEN PRINT A
2+A,19+B, "B";
 2+A,19+B,"B",
555 IF A$(A.B) ="S" THEN PRINT A
2+A,19+B,"B",
 558 IF A$(A,B) ="+" THEN PRINT A
```

2+8,19+8,"X"; 566 LET A\$(A,8) ="X" 565 JF HITP=20 THEN GOTO 120 Ŧ NEXT 600 601 RETURN 1000 REM PLAYER ENTRY 1002 REM PLAYER ENTRY 1002 REM 1015 FOR 5:1 TO 4 1016 PRINT AT 17.0, "TAKE CARE." 1020 PRINT AT 18.0. "ฮ์คารแฮรหวจ DUARE OURRE ", 5. 1025 PRINT AT 19,0; "ESEC"; 1027 INPUT A 1028' IF A=0 THEN LET H=10 1029 IF A>10 THEN GOTO 1627 1030 PRINT AT 19,0; "FOLL"; 1035 INPUT B IF B-0 THEN LET B=10 IF B>10 THEN GOTO 1035 LET B\$(A,B) ="B" PRINT AT 2+A,1+B;"[]", 1035 1949 1045 1050 NEXT S 1053 FOR M=1 TO 2 1054 FOR N=1 TO 3 1055 PRINT AT 18,0, "CRUTSER WUNE FR "; M, " SQUARE ", N, 1058 PRINT AT 19,0; "FRU, " 1060 INPUT A IF A:0 THEN GUTO 1066 IF A:0 THEN LET A-10 PRINT AT 19,0; "BOLD"; INPUT B 1862 1063 1064 1066 IF 8-0 THEN LET 8-10 IF 8-10 THEN GOTO 106 LET 8\$(A,B) -"C" PRINT AT 2+A,1+B,"@", 1067 1068 1066 1070 1075 1077 NEXT N 1086 NEXT M 1006 NEXT H 1006 FOR M=1 TO 3 1005 FOR N=1 TO 2 1100 PRINT AT 18,0, "DESTROYER NO ", M; " SQUARE ", N; " 1110 PRINT AT 19,0, "EQU.", ", 1120 INPUT A IF A-0 THEN LET A-10 IF A-10 THEN GOTO 1120 PRINT AT 19.0. "EDITE". INPUT B 1122 1125 1130 IF 6:0 THEN LET 6:10 IF 6:10 THEN GOTO 1130 LET 8\$(A,8) ="D" PRINT AT 2+A,1+B,"B". 1131 1132 1135 1140 1150 NEXT N 1150 NEXT FOR 5-1 TO 4 PRINT AT 18,0, "SUBMARINE N. 1170 1175 MBER. PRINT AT 19,0. "Etm.", 1190 IF A=0 THEN LET A 10 IF A>10 THEN GOTO 1190 PRINT AT 19.0, "CT.,", INPUT 8 1191 1192 1195 1197 IF B=0 THEN LET B=10 IF B>10 THEN GOTO 1190 LET B\$(A,B) "S" PRINT AT 2+A,1+B,"B", 1198 1199 1200 1205 1210 NE KT 5 F08 9-17 TO 21 1220 1225 PRINT AT A,0, 1230 NEXT A 1250 RETURN 2000 REM MACHINE FIRES BACK 2002 REM 2010 PRINT AT 19.0. "JOIN ITS MASS 5 TO SEE TO 3 REM 3022 HCN=HCN+1 ZX=0 LET 2025 LET 2040 LET A=INT 2050 LET B=INT (RND+10) +1 (RND+18) +1

```
2060 IF B$(R,B)()"#" THEN IF B$"
A,B)-"X" THEN GOTO 2040
2063 PRINT AT 21,0,"
2065 PRINT AT 21,0, "SHOT NO.", MC
N." IS..".A;","A;
2070 IF B$(A,B)="5" OR B$(A,B)='
B" OR 8$(A,B) ="C' OR B$(A,B) ="D'
THEN GOSUB 3000
2085 IF ZX-1 THEN GOTO 2125
2110 PRINT AT 18,0," +++TTS = MIS
2112 FOR U-1 TO
2115 NEXT U
2117 PRINT AT 18,0;"
      LET B$ (A, B) = "X"
2120
2121 PRINT AT
                   2+A,1+B,"X"
2125
      NEXT
2999
      RETURN
3000 REM

3001 REM HAIN FLEET HITS

3002 REH

3010 PRINT AT 2+A.1+B."="

1022 LET 8$(A.8) ="X"

5021 LET AA=A
 3000 REM
                                HITS
3022 IF A-10 THEN LET RA-9
3030 IF B$(AA+1,B)="#" THEN
6$(AA+1,B)="%" THEN
3031 IF BOX OF THEN
                                  THEN LET
3031 IF AA+2>10 THEN GOTG 3039
3032 IF 8$(AA+2,8) -"*" THEN LET
8$(AA+2.8) -"X"
                                 THEN LET
3039 LET AA≈A
3040 IF A=1 THEN LET AA-2
3050 IF B$(AA-1,B)="#" THEN LET
         AA 2(1 THEN GOTO 3060
B$(AA-2,B)="*" THEN LI
 $(AR 1,B) -"X
3057
      IF
                                 THEN LET
8$ (AA-2
3060 LET
           86=8
3070 IF 8-10 THEM LET 85:9
3080 IF 8$(A,88+1) -"*" THE
8$(A,8+1) ="X"
                                 THEN LET
3085 IF BB+2>10 THEN SOTO 3090
3087 IF B$(A,BB+2) -"*" THEN LE
B$(A,BB+2) = "X"
                                  THEN LET
3090 LET BB-B
3100 IF B-1 THEN LET BB=2
3110 IF B$(A, BB-1) ="*" THEN LET
B$(A, BB 1) -"X"
     PRINT AT 18,0, "FEETTE & HIT
3120
* - -
 3130 LET
            ZX=1
 148 LET HITH=HITH+1
3145 IF HITH-20 THEN GOTO 120
3150 FOR U=1 TO 30
3160 NEXT U
      PRINT AT 18,0,"
3176
3180 RETURN
      LET MS-"
5010 LET Z$
5020 LET N$
5030 LET YS .N.
5040
      LET
```

```
5150 RETURN
 5500 REM
 5501 REM SET THE MACHINES PIECE
 5502 REM 1800 1800
 5510
       DIM
            R$ (10, 10)
            B$ (10,10)
H$ (10,10)
 5511
       DIH
 5512
       DIM
 5518
       REM
            BATTUESTIC
 5519
       REM
 5520
       REM
            Y -1
 5521
       FOR
                 TO
                     1 63
            Z=1 TO 10
As(Y,Z)="#"
Bs(Y,Z)="#"
       FOR
 5522
 5523
       LET
       NEXT
 3524
 5525
       NEXT
 5526
       LET
 5530
           A-INT
                    (RND +10) +1
          HK4 THEN GOTO 5530
 5531
 5540
       LET
                   (RND 110) +1
           B=INT
       IF
          B(4 THEN GOTO 5540
A)7 THEN GOTO 5700
 5541
       IF
 5550
      IF 8>7 THEN GOTO 5:00
IF A>B THEN GOTO 5600
FOR I=1 TO 4
LET A$(A,B-1+I) ="B"
 5560
 5565
 5567
 5568
 5569
       GOTO 5730
 5570
 5600
       FOR
            I=1 TO 4
5691
           R$ (R -1+I,B) ="B"
       LET
5602
       NEXT
 5605
      GOTO 5/30
REM
       COTO
 3700
 5701
      REM 器SETTING BSHIP AT BOTTO
IF A>B THEN GOTO 5720
FOR I=1 TO 4
LET A$(A,B+1-1(="B"
5705
5707
5710
5711
      NEXT
5715
      G010 5/30
      FOR I-1 TO 4
LET A$(A+1 I,8)="B"
5720
5721
5722
      NE XX
5728
      REM
           JE1 10 2
5729
      REM
5730
      REM
5732
      FOR
           A-INT (RND 10) +1
5735
      LET
          AK3
5735
      IF
5737
5736
      LET B=INT (RND +10) +1
1F B (3 THEN GOTO 5737
IF A + (A,B) (>" *" THEN GOTO 5
5740
735
5742
      IF
         A>8 THEN GOTO 5800
      IF 8>8 THEN GOTO 5000
IF A>B THEN GOTO 5780
5743
5744
5745
      FOR 1-1 TO 3
5747
      IF
         ## (A.B 1+I) ↔"#" THEN GO
TO 5735
5748 NEXT
      NEXT I
FOR I=1 TO 3
      LET A$ (A, B -1+1) = C"
5 749
5750
      GOTO 5900
5 7 5 2
5 780
      FOR
          1=1 TO 3
5782
      NEXT I
           I-1 TO
5 283
      FOR
                    3
          A$ (A 1+I,B) _"C"
      LET
5784
      NEXT
5785
      NEXT I
GOTO 5900
5 786
      IF A>B THEN GOTO 5850
FOR I-1 TO 3
IF A$(A,8+1-I) <>"#" THEN GO
5899
5302
5803
TO 5735
5804 NEXT I
```

20

母亲压

NUME

R NO

E NE

5

```
5806 LET A$(A,8+1 I)="C"
  5807
         NEXT
                I
        GOTO 5900
  5810
  5850 FOR I=1 TO 3
  5851
            A$ (A+1-1,B) <>"#" THEN GO
         IF
  TO 5735
  5852
         NEXT
  5853
         FOR I=1 TO 3
        LET I
  5854
              A$ (A+1-1,B) ="C"
  5855
  5900
        NEXT
             DESTROYERS NEXT
 5998
        REM
  5989
        REM
 5910
        REM
 5911
        FOR
 5912
        LET
        IF
 5913
            R(2 THEN GOTO 5912
        LET B=INT (RND 10) +1
IF 6 2 THEN GOTO 5914
IF R$ (A,B) <>"+" THEN
 5914
 5915
 5916
                              THEN GOTO 5
 915
 5920
            A>9
                  THEN GOTO 5970
        IF 8>9 THEN GOTO 5970
IF 8>8 THEN GOTO 5950
 5921
 5922
        FOR I=1 TO 2
 5925
 5926
        IF
    5912
 TO
        NEXT I
FOR I:1 TO 2
LET A$(A,B-1+I) ="D"
NEXT I
 5927
 5930
 5931
 5932
        GOTO 6000
5933 GOTO 6000
5950 FOR I=1 TO 2
5951 IF A$(A 1+I,B)<>"#" THEN GO 8045 PRINT " YOU THEN
HOTS. THE"
6050 PRINT "MACHINE HAS
 5933
       FOR I-1 TO 2
LET A$(A-1+I,B)="D"
 5959
        NEXT I
 5960
        GOTO 5000
       IF A>B THEN GOTO 5990
FOR I=1 TO 2
 5970
 597I
 5972
        IF
    5912
 TO
5973
       NEXT
       FOR I=1 TO 2
LET A$(A,B+1-I)="0"
 5974
 5975
5976
       NEXT I
       GCTO 6000
5979
       FOR I=1 TO 2
IF A$(A+1 I,B) <>"#" THEN GO
5990
5991
TO 5912
5992
       NEXT
       FOR I=1 TO 2
LET A$ (R+1-I,B) ="D"
5993
5994
       NEXT I
5995
6000
      FOR J=1 10 4

LET A=(INT (RND*10))+1

LET B=(INT (RND*10))+1

IF A$(A,B)()"*" THEN GO
5100
6105
6107
6118
                              THEN GOTO 6
105
       LET A$ (A,B) ="5"
6115
5120
       FOR X=1 TO 10
FOR Y=1 TO 10
LET H$(X,Y) =A$(X,Y)
5125
5126
6127
       NEXT
5128
       NEXT
6129
5999
       RETURN
7000
       SLOW
       REM
7008
      REM PRINT SCREEN
7009
7010
7015 PRINT K$, M$, N$, O$; P$; Q$, R$,
S$; T$, U$, U$, U$, X$, Y$, Z$, L$;
7020 RETURN
            HNEGELOUS
       REH
7500
7501
       REM
                        DISPLAY
7502
      REM
7510
      PRINT AT
                   2,9,
7511 PRINT AT 3,9,"器
```

7520 PRINT AT 4,9; "# ERTTLESHIP 7<u>5</u>22 PRINT AT 5,9," 7525 PRINT AT 6,9;" 7530 PRINT AT 15,3; "DO YOU WANT AT 18,10;"(Y OR N) 7535 PRINT 7540 LET 0\$=INKEY\$
7550 IF 0\$()"Y" TH
THEN GOTO 7540 THEN IF GSO"H" 7560 IF Q\$="Y" THEN GOSUB 8000 7565 CLS 7600 RETURN 3000 CLS 8010 PRINT " SINK THE "
8012 PRINT "MACHINES FLEET BEFORE IT SINKS YOURS."
6015 PRINT " THE MACHINE FIRST OF ALL POSITIONS ITS OUN F. THE OBJECT IS TO 8020 PRINT " YOU ARE THEN A)8 THEN GOTO 5950

D TO INPUT YOUR BATTLESHIPS."

A\$(A,B-1+I)()"#" THEN GO 8025 PRINT "ONE BATTLESHIP (4 50 UARES), TUO" "CRUISERS (3 SQUARES) THREE " THREE"
8035 PRINT "DESTROYERS
S) AND FOUR"
S040 PRINT "SUBMARINES (2 SQUARE "SUBMARINES (1 59UARE YOU THEN FIRE 3 5 JON. BOSS PRINT 3, AND LOUEST NUMBER OF SHOTS WINS." 3060 PRINT 8101 PRINT "THE MACHINE DOES NOT THINK AS " R T=1 TO 2
A\$(A,B+1-I) <>"*" THEN GO 8102 PRINT "YOU DO, BUT IT HAS S
PIES TO GIVE"
R T=1 TO 2
R T=1 TO 2
R T=1 TO 2
R T=1 TO 2
R T=1 TO 2 YOUR FLEET."
TOA PRINT "IT GETS THIS RETER E 3104 PRINT ACH HIT" 8106 PRINT AT 21,8," (PLEASE WAIT 8110 FOR G=1 TO 200 3120 NEXT G 3130 CL 5 3149 RETURN 9000 FOR U=1 TO 20 9010 FAST FOR I=1 TO 5 9012 NEXT 9015 9029 SLOW 9030 NEXT U 9040 IF HITP=20 THEN PRINT AT 17 9050 IF HITP:20 THEN GOTO 9300 9060 PRINT AT 17,0."I HAVE BEATE N YOU. 3070 PRÍNT AT 18.0, "HERE IS MY U HOLE FLEET", FOR A=1 TO 10 FOR B-1 TO 10 PRINT AT 2+A,19+B,H\$(A,B), 7080 9090 9100 NEXT B 9110 9120 3300 RETURN

A STATE OF THE PARTY OF THE PAR

On the side

고유 등

NT

3 "

.14.

TO

FOR

FL

SKE

50

ES)

RRE

ARE

3 5

D 5

OF

NOT

5 5

DUT

RE

TIF

17

ATT E

YU

90

A short utility allowing you to print sideways, courtesy of James Southgate of Colchester.



This program will run on a 16K or 48K ZX Spectrum with a printer attached. The isting first creates the user-defined characters turns them sideways, enlarges them and then prints them up on the printer. You can then print up massages many metres ong, occupying the full width of the printer paper.

Best of three

The program is divided into three sections. The first section, comprising lines 150 to 300 reads the decimal numbers which make up the user defined characters and converts them into binary numbers. Lines 170 to 190 check that the message entered contains the user defined graphics characters. The second section lines 320 to 410 turn the characters on their side.

The final section, contained in lines 430 to 500, takes the sideways characters enlarges them and sends them to the printer.

This version of the program only accepts user defined characters of A to U, plus the facility of being able to use spaces. Should you wish to use the remaining letters of the alphabet or symbols of your own choice, then you will have to define them yourself see chapter 14 of the Sinclair Spec-

trum manua and then load this program. You should, however be able to construct a wide variety of messages with the letters a ready defined in the program given.

in use

To use the program, enter it, SAVE to tape and then RUN to Now input your message of your message may be of any length, but remember that as we as taking time to print out you will also use a lot of printer paper so make sure your message is spelt correctly! Characters may be used more than once within the same message. Once the print out has been completed, RUN the program again and enter the next message you wish to be printed out.

The Listing provided shows the complete program. However if you wish to utilise parts of the program for use in other stings, lines 150 to 300 could be modified to form a decimal to binary convertor program. Also nes 100 to 410 could be used to turn user defined characters sideways, retaining their original size for inclusion in your own programs to improve presentation in some way.

To find the binary numbers which make up the sideways characters you can delete lines 430 to 500 and add the lines shown in Fig. 1.

```
150 DIM a(8): LET a(1)=128 LET a(2)=64: LET a(3)=32: LET a(4)=6 LET a(5)=8 LET a(6)=4: LET
       2 LET a (8) =1
INPUT "ENTER MESSAGE
3(7)=2
                                              GE > ",a$
IF a$(s
180 INPO | "ENTER MESSAGE > ", as 170 FOR s=1 TO LEN as: IF as(s " " THEN GO TO 190 180 IF CODE as(s) <65 OR CODE as (s) (97 AND CODE as(s) >85 OR CODE as(s) >117 AND CODE as(s) <144 OR CODE as(s) > 164 THEN PRINT as(s)
        a$(s)>164
ISN?
 "ISN'T A USER
BEEP 1,-20
190 NEXT S
                              GRAPHIC CHARACTE
                              STOP
      FOR P=1 TO LEN

IF a$(P)=" " Th

GO TO 490
 200 FOR P=1
                                  THEN CLS .
 220 LET
               y=U5R as(p)
       DIM 6$ (8,8)
FOR 3=0 TO 7
 230
 240
                b$ (i+1) ="000000000"
 250
 250
270
               X = PEEK
       LET
                               (y+i)
       FOR n=1 TO
280 IF
            x > = a(n)
                             THEN LET be(i+1,
              LET
                     x=x-a(n)
       NEXT i
 290
 399
        REH
 320 REM
               *TURN LETTER SIDEWAYS*
```

```
REM
  330
  340
                es(8,8)
         LET
                k = 1
  350
                1=1 TO 8
f$=""
         FOR
  360
        LET
  370
                n=8 TO 1 STEP -1
  380
         FOR
                fs=fs+bs(n,k): NEXT nes(i)=fs
  390
         LET
         LET
  400
                k = k + 1:
  410
                            NEXT i
         LET
  420
                 **PRINT LARGE LETTERS**
         REH
  430
440 REM

450 FOR i=1 TO 8

460 LET c$="": FOR n=1 TO 8

470 LET c$=c$+(" "AND &$(i;

n)="0")+(" "AND &$(i;n)="1")

480 NEXT n: LPRINT &$'c$'C$ NE
         REM
                  P
1,20:
  500 BEEP
The main part of the BASIC listing.
```

430>FOR n=1 TO 8. PRINT "BIN "; e\$(n): NEXT n 440 PRINT : NEXT p 450 STOP

Fig. 1. If you want to find the binary numbers which make up the sideways characters, delete lines 430 to 500 and insert the above

Educating, Peter?

Peter Shaw takes a look at some educational software packages for the Spectrum.



It was only a few months ago that heard someone say. There is a big gap in the soft ware market for Educational tapes. Looking around now there seems to be an ever growing collection of companies writing pre-school and schoolage software.

Here are a selection of some of the software packages available

Adding And Subtracting 16/48K Spectrum Widget Programmes

The three programs on this tape are brilliant. Great use of machine code and Hi, resignaphics.

In 'Adding, you count the number of blocks put anto the two wagons of a train, then you add them together if you get your sums right, the train moves off in a Heres scrol, puffing smoke as it goes. Subtracting shows you a graph cal picture of a port. You then type in the number of crates you can see or the poat if you get this right a little man runs down and lakes some of the crates off you then type in the number he has taken off followed by the number eft

Ducks the last program of the tape, is a combination of addition, and subtraction. My favourite educational tape.



Counting 16/48K Spectrum Widget Programmes

s ago

say

SOIT

tiona

DO W

grow.

an es

chool

some

ages

m

tape

e of

res

t the

o the

n you

u get

aves

iff ng

tng

re of the

ee on

b td

akes

you has

The

m on of ad

Μv

1984

Widget have gone into educational software in a big way they have bright colourful in sens and simple instructions

with every rape Counting includes four programs Count' where you must count the number of monsters on the screen. Count. Cats in which you have to decide how many of one object. are scattered amongst the other things Rockets' where you have to count the number of spacemen in the rockets, and lastly Count 100, where you must count the number of men who somet mes stro onto the screen up to a maximum of 100

All four programs are well written bug free and worth a

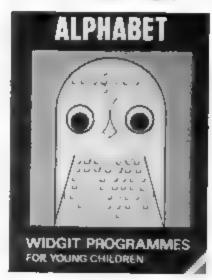


Shape Sorter 16/48K Spectrum Widget Programmes

The three programs on this tape include 'Shape Sort' 'Houses and Size Sort'



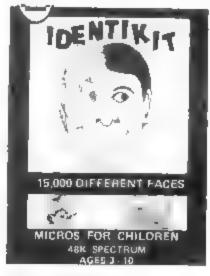
Shape Sort and 'Size Sort are just what the name implies. Houses' is a spot the difference' game. On eye two tigets pretty difficult. Again great use of colour and graphics.



Alphabet 48K Spectrum Widget Programmes

This program is similar to the books which have a different picture for every letter. The program also has a lower case training mode which draws a lower case letter on the screen (pretty big., then draws the shape to go with it

I'm surprised they found room for this program n 48K



Identikit 48K Spectrum Stell Software

This reminds me a great deal of the VIC 20 program, Facemaker You can choose the hairtype eyes nose, mouth and ears then, as an extra feature, waggle parts of the face

There is superbluse of colour graphics in this program, as well as a good sprinkling of machine code.

Time 48K Spectrum Stell Software

This program displays a large graphic clock, and then says 'Stop the clock at o clock' titakes quite a while for the hands to get around to the precise time so your pupil may ose interest in the program.

There are many variations of duding a section which teaches minutes past letc.

Not a bad package but perhaps a tile bit slow



Eiffel Tower 48K Spectrum Chalksoft

Unfortunately my review copy constantly crashed. This may have been because I had Microdrives attached, or because it was abad tape. What do know about the program is that it is a variation on French hangman' where you must translate between English and



French to build the Fifte Tower Definitely one of the more fun ways to learn the French anguage

Telling The Time & Money 16K Spectrum Poppy programs

in Telling The Time you have to write the time displayed in words, eiten pastis x or twenty to five Unfortunately, the program is painfully slow, and even Time (Stell) is faster.

'Money fairs better You are shown the coins you can choose from and you are to ditory veithe computer a Lertain amount Pressing the corresponding keys will make the coins for notes) appear further down the screen, and are added to your running total. If you give the computer the right money the sums seem to get harder.

I liked Money but I must say that 'Te ing the time' was a bit of a disappointment

Program name	Price	Company	Address	Marks out of 10
Counting	£5 00	Widget 48 Durham Road, London N2		8
Adding 6 Subtracting	£5 00	Widget 48 Durham Road London N2		10
Shape Sorter	£5 00	Widget 48 Durham Road London N2		8
A phabet	£5 00	Widget 48 Durham Road London N2		9
1 me	f5 00	Stell, 36 Limefield Avenue Whalley, Lancs 886 9Ru		6
Identikit	£5 00	Stell, 36 Limefield Avenue Whalley Lancs BB6 9RJ		9
E-ffel Tower	£5 00	Chalksoft, Los Cottage, Tone		
		We Ington, So TA21		6
Teling Time. Money	£5 50	Poppy Programs, c o Vera Sampson, Richmond House Ingleton Carnforth, Lancs LA6 3AN		7

Off the wall

An interesting variation on the 'maze' theme from C Elliston of Suffolk.



This is a simple game for your ZX Spectrum - simple but extremely difficult to play

You control the flow of bricks around the playing area of the screen using the four direction keys on the Spectrum. The stream of bricks can only be stopped if you run into another, wall or you change direction.

The idea of the game is to manoeuver the stream of bricks, which leaves a wall behind if trying not to hox yourself in However it's not as easy as you might first think as there are a random number of bricks scattered throughout the playing area which get in your way

You score points while you keep the stream of bricks in motion and if you manage to surpass a score of 80, you qualify for another screenfull. Of course this time it gets more difficult as there are more random in the classification of the score so far is 513. see if you can beat it if you re looking for one word to describe this game, try addictive type it in and you is see what inteen

Line by line

Here follows a breakdown of the listing with a suggestion for changing the game a little to suit your own requirements

cine	38 40 50
Lre	5000 6000

шле 5053

Lines 11 14

Set up the user defined graphics
Print the border wals
Prints the score on the border wall
Print the random bricks in the playing
area
Contain the main games loop
Tests to see if you are 'boxed' in
Calculate the score
Converts the number of bricks into a
percentage of the screen covered
This line can be changed to lower the
score required to move on up to another
screen For example if you wanted to get
another screen after 50 points you would
have to make line 5053

5053 IF PC > 50

Lines 6000-7000. Contain the instructions for the game

The above screen illustration shows your character as you start the game, the second illustration below shows how easy it is to get yourself blocked in!

Long and I	ALC: OF IN IN IN	1 1137						
PRE	H							
de la company				Title				
至 1283	.55	DANC	KEY	1 7 (2)				
			O.E.	Y TO	PLR	V OC	HIN.	- 7
20年 (中国政策管理等			-			1 17 (3)	-1 T M	
AREA DESIGNATION OF THE PERSON NAMED IN COLUMN TWO IN COLU	OTHER DESIGNATION OF REAL PROPERTY.			以前途中国 市	-	新田田 化自体电阻		- 4
35 1 1 1 1 1 1				The same	The second		198	
で女性を発音を表				77466	400		No.	
*rengens		150		Shippers.			200	
		lar and		Brance	No.		H.0	
			10 mg				-	
コニカを出る (1)					-	March spring	Brid.	
计五里等电池的			TW.	Harage	the same of the sa	-		
E IT THE WHITE OF SE							44	
"STORES				THE PERSON NAMED IN	100			-
4年在田田田田田					100		46.0	- 10
TEC & SERVE		25 mg/	Et by	20	CD 31		-	70
POST PROPERTY.		T		BREEFE			100	10
			indicate or				9.4	
OF BEINGE		White is the said of	I Holland				U-harm	12
TANK BERRE			West .		SAN SER	75.34		- 6
'sersydem		9.9	-	Games Per		*****		12.5
*CHERROL		-	- Gran					ll-ei
"但我就是自由自						P Brokel man		100
* · · · · · · · · · · · · · · · · · · ·		- Annu	m -(r)				Bawa	107
WHITTHEAD			On a	明确自然	4			10
			With he	of the state			Sections.	10
THE PRESENTATION			田田田町山					100
7月三日司 医食品配	77744		Deal Britains	To design a				- 81
	ecsil.	4444						- 65
: 37 SHERRIES		1000000					Title and t	
で可能を発せ		Description of the last of the				1.000		
TERRES	-			2200			Wang maga	-14
*CTE	Bron							- 20
TOTAL	7.0				E what diverse a			- 21
	CH				The Party of the Party of			6
TER					7-0	De la company	11.	45
THERE.						-		च
1 可伊益		20206	deserge:			_		10
4222							OFFICE	200
	Phase.					Miling with a	100 H 100 h	
700 E	THERMA	TRESTER			*****	ر و بازی چه چیست کار	THE RESERVE	-
	法自己的证券	With Hillschap in				- 12 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B. 10 B.		
					والأقشار برجوي	STREET, STREET		72
								- 77

11 FOR n=0 TO 7 READ z PORE R "a"+n, z NEXT n 12 DATA 0,119,119,119,0,238,2 3,238 13 FOR n=0 TO 7 READ Z: POKE R "b"+n,Z: NEXT n 14 DATA 24,24,68,90,153,36,36 JSR. 102 GD 5UB 6000 15 hi=0: LET fr=0 LET h=20 ≤ core=0 LET 18 x=10. LET y=15 a\$="A" LET X=10 20 30 32 PŘINT BRIGHT 1; PAPER 7; IN K 2; AT 0,0; "ARAAAAAAAAAAAAAAA AAAAAAAAAA 38 PRINT #1, PAPER 1; INK 7, AT 0,1; "SCORE=", AT 0,15, "HI SCORE=

40 FOR b=1 TO h
45 LET c=1NT (RND*20) +1
46 IF c=10 THEN GO TO 45
47 LET d=1NT (RND*30) +1
48 IF ATTR (c,d) > 100 THEN GO TO
49 BEEP .01,d
50 PRINT BODED 7 THE

1 45 49 BEEP .01,d 50 PRINT PAPER 7, INK 2, BRIGH T 1,AT (,d,a\$' NEXT b 55 FOR n=-20 TO 20' BEEP .01,A 55 n+15. NEXT n 60 PRINT AT x,9,"B"

5200

5210 5220

NEXT D

```
80 PAUSE Ø
 100 IF INKEY $= "5" THEN GO TO 10
32/
 200
           INKEY$="6"
                              THEN
                                      GO
                                            ΤÖ
06
           INKEY $="7" THEN
 300 IF
                                      GO
                                           TO
30
 400 IF INKEY 4="8" THEN GO TO 40
33
13
450 PRINT AT x,y,"B"
455 IF ATTR (x+1,y)>32 AND
455 IF ATTR (x+1,y)>32 AND
X-1,y;>32 AND ATTR (x,y+1)
(x,y 1)>32 THEN GO
                                            ATTR
                                 (x,9+1) >32
HEN GO TO
AND RITE (x,y 1)>32
200
 500 GO TO 100
THEN GO
TO 100
1020 PRINT PAPER 7, INK 2, BRIGH
1 1, AT x, y, "A"
1025 PRINT #1, PAPER 1, INK 7, AT
0,7, INT ((score #100)/(599-h))+/
      LET y-y-1
IF y<-0 THEN LET y=0
PRINT AT x,y,"8"
BEEP .01,21 x
LET score=score+1
IF INKEY $="6" THEN GO TO 20
1232
1035
1940 PRIN
1950 BEER
1955 LET
1060
.070 IF INKEY $="7" THEN GO TO 30
23
 1090 GO TO 1000
2000 REM +++++++DOUN++++++++
      IF ATTR (x+1,y) >32 THEN GO
    100
*020 PRINT PAPER /,
1,81 x,9,"A"
2025 PRINT #1, PAPE
                               INK 2,
                                          BRIGH
            NT #1, PAPER 1; INK 7,AT
((score#100)/(599-h))+/
                       PAPER 1;
 0,7, INT
1030 LET x=x+1
2035 IF x>-21 THEN LET x=21
7040 PRINT RT x,9,"B"
2050 BEEP .01,21-x
          T score = score +1
INKEY $= "5" THE
      LET
-060
      IF
                              THEN GO TO 12
 480 IF INKEY $-"8" THEN GO TO 40
2090 GO TO 2000
 1900 REM
            ++++++++UP++++++++
          ATTR (x-1,y)>32 THEN GO
 1910
      IF
    100
 3020 PRINT PAPER 7,
                                INK 2,
                                          BRIGH
1,AT X,9,"A"
3025 PRINT #1,
            (f #1, PAPER 1, INK 7,AT ((score #100) / (599 h)) + f
 0,7, INT
4030
       LET x =x 1
IF x <=0 THEN LET x =0
 3935
      PRINT AT X,4,
 3040
      BEEP .01,21-x
LET <core=score+1
IF INKEY$="5" THE
 1050
3955
 1960
                              THEN GO TO
                                                 10
33
 080
      IF
           INKEY $= "8" THEN GO TO 40
 3090
      GD TO 3000
4000 REM +++++++++RIGHT+++++++
4010 IF ATTR (x,y+1)>32 THEN GO
   100
4020 PRINT PAPER 7,
                               INK 2,
                                          BRIGH
T 1,AT X,9,"A"
4025 PRINT #1, PAPER 1;
             // #1, PAPER 1; INK 7;AT
((score#100)/(599-h))+f
4030 LET y=y+1
4035 IF y>=31 THEN LET y=31
4040 PRINT AT x,y,"B"
4050 BEEP .01,21-x
           SCORE=SCORE+1
INKEY$="6" THE
4055
                              THEN GO TO 20
4070
99
           INKEY $="7" THEN GO TO 30
4080 IF
```

```
90
4090
         GO TO 4000
          REM ++++++++++5CORE++++++
LET pc=INT ((score +100) / (5
5000
5025
                                   ((score #100) / (59
9-6))
  030 LET (r=fr+pc
035 IF //>hi THEN LET hi=fr
050 PRINT #1; PAPER 1; INK 7;AT
0,1;"SCORE=",INT pc;" ",AT 0,15
"HI SCORE=",hi;"
053 IF pc>=80 THEN GO TO 5060
054 LET fr=0: LET pc=0 LET h=2
5030 LET
5035 IF
5035
5050
5053
5054
O
3055 Pk...
1;AT 2,1," Ph...
Y AGAIN.
5059 GO TO 5069
5060 LET pc=0 LET h=h+10
5063 PRINT FLASH 1, PAPER 6,
0,AT 2,3," Press key for ne
ŠØ55 PRINT PAPER 6, INK Ø, FLASH
1;AT 2,1," PRESS ANY KEY TO PLA
                                                                 INK
           PRINT PAPER 4, AT n,1,"
                                                              BEEP
   .01,n
5090
         NEXT
1090 PRINT #1,
0,7,fr,"
5095 GO TO 18
1000 REM +++++++++INSTR+++++
1000 REM +++++++++ OLS
1000 DRAW 0,175 D
                     n.
                                                     INK 7, AT
2040 NEXT 0
                       PAPER 7, INK 2, BRIGH
     1,AT 10,1,
                      A
8060 FOR h<sup>2</sup>11 TO 20
8070 PRINT PAPER 7, INK 2; BRIGH
I 1;87 n<sub>2</sub>1,"88888888888888888
ī 1;87 n.1,
8888888888
BAAAAAAAAAAA
"AAAAAAAAAAAAAAA
1095 FOR n=0 TO 135

5100 LET a$=a$(2 TO )+a$(1)

5110 BEEP .05,CODE a$(28),4

5120 PRINT PAPER 7, INK 2; BRIGH

1 1,AT 10,2,a$(1 TO 28)
11,AT 10,2,a$(1 TO 28)
130 NEXT n
0134 PRINT BRIGHT 1; PAPER 1; IN
4 7,AT 10,5; "press key to contin
                                              PAPER 1; IN
           PAUSE
5135
                        20
5140
         PAPER
                        4
                               CLS
                     PAPER 4; INK 0;AT 2
CURSOR KEYS TO STEER
OUND THE BRICK-YARD."
   USE THE
5150
                                                               2,2
     BILL AROUND
5160 PRINT PAPER 4, INK 0,AT 6,2
"AT THE END OF EACH GAME YOU
WILL BE GIVEN THE APPROX
PERCENTAGE OF THE YARD WHICH
IS COVERED WITH BRICKS."
PERCENTAGE OF THE YARD
IS COVERED WITH BRICKS.
5170 PRINT PAPER 4, INK 0
T 1, AT 15,4, "PRESS ANY KE
                                            INK Ø,
1 1, AT
                                                            Ŧò.
5175 DRAW 255,0: DRAW 0,175: DRAW -255,0: DRAW 0,-175
          FOR n=9 TO
BEEP .03,n
                           TO 40 STEP 5
5190
```

IGH

I,A

he

ξ

ΚE

36,

IN

IN

IN BAF

AT RES

3

BAR

,23



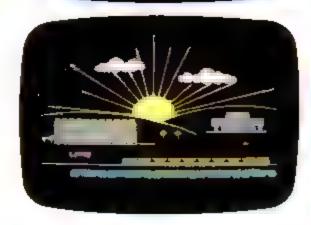
















THE MOST IMAGINATIVE GRAPHICS PROGRAMMING SOFTWARE FOR YOUR SPECTRUM













There's now one piece of software that's a must for every 48K SPECTRUM owner.

It's called "PAINTBOX".

If you wish to exploit the full graphics capability of your machine, you can do so . . . simply and easily with "PAINTBOX".

"PAINTBOX" is produced by Print 'n' Plotter Products — the company that has pioneered (and led) the field of graphics aids for ZX Computers.

With our name and reputation you are assured of

quality and immense graphics capability!

Take a look at the actual screen prints opposite They are the sort of thing you could produce on your SPECTRUM

With a little practice — and 'PAINTBOX''could be planning, producing, and utilizing these sort of graphics in your programs producing software that will come alive with originality!

Just look at some of the facilities available from

"PAINTBOX":

UDG EDITOR:

Giving you the facility to define (and re-define) up A to 84 graphics characters which can be held in memory, stored in your BASIC programs for instant recall from its own built-in machine code!

UDG DRAWING BOARD:

A fully integrated UDG Planner for up to 4 Banks of user-defined characters. Planning facilities include MIRROR IMAGE, ROTATE, INVERSE, and FILE

SKETCHPAD:

An experimentation "window" that allows you to try-out your UDG ideas during development of the 84 graphic character set

PRECISION PLOTTER:

An amazingly versatile high resolution drawing board which includes PAPER choice, INK choice, PLOT, DRAW, DRAW RADIALLY, CIRCLE, ARC. OVER FILL, instant change of INK colours (including BRIGHT), ERASE, and STORE in permanent memory during development!

All cursor movements can be controlled by loystick or Keyboard operations, with choices which include FAST or SLOW movement and "Crosswire"

or single Pixel cursor!

SCREEN PLANNER!

Combining the best of both worlds! PRECISION PLOTTER and UDG Characters! For complete screen planning of graphics. A multi-purpose graphics facility to enable you to produce screen graphics that are the equal of those seen in bestselling software!

All graphic results can be sent to the Printer, saved as SCREEN\$ or SAVED as CODE with its built-in machine code routines for instant recall from BASIC.

"PAINTBOX" is such a comprehensive graphics toolkit that it is impossible to describe it all in one advertisement!

The program comes complete with a cassette demonstration of what you could produce with "PAINTBOX" including a 28 page booklet describing in easy-to-understand language how to use it for best results and many tips for storing and using your graphics in BASIC programs.

Of course, 'PAINTBOX' is ideally suited for use with Print in' Plotter's other great graphics aids

The dedicated programmer will want to use it in conjunction with our ZX SPECTRUM JOTTER PAD

THE ORIGINAL (AND BEST GRAPHICS PLANNING PAD!

So why not place your order today?

Write now Phone your Credit Card Ask at your

local computer shop

At only £7 50 (plus p&p) its a marvellous investment for all ZX SPECTRUM owners of all ages!



Post to Dep ZX Print in Plotter Products Ltd., 9 Borough High Street London SE1 9SE - Please send me

PAINTBOX SOFTWARE @ \$7.50 + 75pp + ptota £8.25 SPECIFIC MIOTIER PADS @ 27 50 | £1 50 p + pilota | £9 SPECTRUM KEYBOARD OVERLAYS @ \$2 60 15pp+p .o al \$2 95

5 ROLLS ZX PRINTER PAPER @ £., 55 95pp+p total \$12.50

SELF ASSEMBLY CONSOLE (SPECTRUM @ £4 50 75p p + p tota £5 25

I enclose fem Itance in full

Please bulling Access Barc ayourd V sa Mastercard No.

Overseas orders piease add 25% for additional surface mail rate

NAME

ADDRESS

DEALERS:

Phone 01 403 6644 for enquiries



Can you save the Earth from impending doom in this program written for us by Akram Malik of Eltham.

In this program it is your unenviab e task to once again defend the Earth from the allen hordes

this time in the shape of angers from Heli and then by a number of demons

The first wave of aliens are called Heil's angels and are capable of great destruction should they be allowed to pass through your defences indeed should you let more than five of the ange's passed you will find that your mission has failed and Earth will be destroyed You must shoot 20 of these angel c upstarts before you get through to the next stage of the game where you will meet the fully fledged demons

Demonic danger

The demons are, of course, much more powerful than the Hell's angels and your task is

time if you only let two through then Earth will be considered destroyed Stl. if you ve managed to get through to this stage of the game you will no doubt have your alien shooting eye targeted in on the aliens (f

demons out of the sky you can congratulate yourself on having saved the Earth

Care must be taken to make sure your aim is true before you shoot at the allens as you have 100 laser points to destroy the invasion force. Obviously, if the

Farth is destroyed the game ends with a message informing you of the sad fate of human kond.

The controls used in the game are keys 1 to 5 to move right, keys '6' to '0' to move left and any key on the bottom row to fire your laser

you manage to shoot 20 of the your defences. However this

GO 5UB 4000 LET hi=0 SC=0 E LET Б LET an =20 GO 5UB 1000 10 BORDER 1 PAPER 5. L5 FOR g=1 TO 21 PR POR h=0 TO 7 PLOT 20 PRINT AT 9,0 "A"; AT PLOT FOR h=0 TO 7 PLOT K 3,255,0' NEXT h PLOT 0,167: DRAW 2 PRINT AT 0,0, INK B 10; INK 2,"HELLS 4, INK 0,"HI";h; LET (p=100 LET at LET a\$="BC" AW 255,0 50 50 TAB 10; 24, IN ANGELS", T AB 60 at =5 =16: i=2: LET q=INT (RND+17: +5 30 PRINT INK 0, AT 1,4, a\$ 90 PRINT AT 20,c; 4, a\$ 95 IF 1=20 THEN GO TO 270 (30) -(The capture of the capture an=0 THEN GO TO 1310 100 LET C=C+(IN 61438()255 AND C(30) -(IN 63486()255 AND C)1\
110 PRINT AT 20,c, INK 2,"D"
120 PRINT OVER 1; INK 0,AT 1,q a **\$** 125 i = i + 1130 LET Q=Q+INT (RND+3) 1+ (3 AN 9 (-30) - (3 AND 9 30) 1; IN 140 PRINT OVER INK Ø,AT .01,12 1=20 AND BEEP 155 (9=c OR 9+1=c)

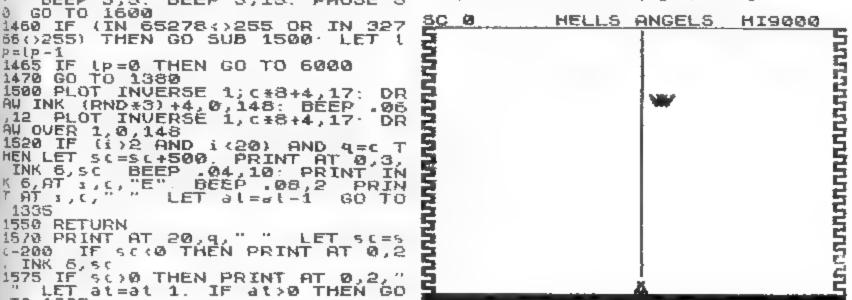
HEN PRINT AT 1,0.1; "EI INK 2,AT 10,3, "You ", e ", INK 0,"been "; IN 1; "DESTROYED!" BEEP 1,10 PAUSE 150 GO T(160 IF (IN 65278()255 5()255) THEN GO SUB 2(THEN PRINT AT C 1;"EEE" You ". IN PRIN INK 2. P 2.5: TO 300 3, "ha "hy BEER GO TO OR IN 327 66 () 255) # 185 IF LP = 0 THEN GO TO 6000 170 GO TO 80 200 PLOT INVERSE 1, C #8+4, 17 80 INK INT (RND #3), 0, 148 BE 100 PLOT THUERSE 1, C #8+4, 500 LET OT INVERSE 1, C #8+4, 17 INT (RND #3), 0, 148 BEEP PLOT INVERSE 1, C #8+4, 17 26,16: DRAU 0 SC=S(+500 .08,5 ## C-1 TO 78 250 RETURN PRINT AT AT 20, q," SC (0 THEN 56 SC-200: PRINT AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2,50
AT 0,2 INK INK LET at=at-1 IF at 0 THEN 0 o TO 85 PRINT 285 FLASH 1, AT 10, INK et L!", INK 1 FLASH 1, FL thru: Ø,

290 BEEP .5,10 BEEP 1,-30 P 2,20. BEEP 3,0 310 IF sc>h; THEN LET h; =sc 320 BORDER 3 PAPER 7 INK BEE INK 3 C 330 FOR h=0 TO 40 STEP 8 FOR t =40 TO 0 STEP -10 BEEP .07,h B EEP .04,t NEXT t NEXT h 340 PRINT AT 1,10, FLASH 1, "GAM E OVER", AT 3,1, FLASH 0, "Earth M ill now be destroyed.", AT 10,5, Your score was ',sc. AT 12,5, 'Hi -IL now be des ', sc. Hi our score was ', sc. Hi score is ', bi 350 PAUSE 300 GO TO S 350 PAPER 1 1000 BORDER 1 ING

1010 PRINT AT 0,10; "HELLS ANGELS
', OVER 1,AT 0,10,"
.AT 4,3, "Keys 1 TO 5-move (1951",AT 5,3, "keys 6 TO 0-move (eft",AT 8,3, "Bottom row keys-fire",AT 14,2, "Press any key to start"
1100 PAUSE 500 RETURN
1310 FOR y=0 TO 20 STEP 2: BEEP
.08,y BEEP .2,5: NEXT y
1315 BORDER 2 PAPER 1. INK 7: C L5 1317 PRINT AT 11,12,"STAGE 2": CLS RUSE 50 1319 FOR r=1 TO 21: PRINT AT r,0,"F", AT r,31; "F" - NEXT r
1320 FOR w=0 TO 7: PLOT 0, w: DRA
W INK 4,255,0. NEXT w 1324 PLOT 0,167 DRAW 255,0 1329 PRINT AT 0,0, INK 6;"5C ";s (,TAB 10, INK 5;"HELLS ANGELS",T AB 24, INK 4;"HI";hi 1330 LET at=2: LET c=16: LET at= c=16: LET al= 1335 LET 1=2: LET q=INT (RND*17) 1540 IF at=0 THEN GO TO 2000 1380 PRINT INK 6; AT 1,9; "G" 1390 PRINT AT 20,c," " 1395 IF i=20 THEN GO TO 1570 1400 LET c=c+(IN 61438/1057) 1400 LET c=c+(IN 61438<>255 AND (30)-(IN 63486<>255 AND (>1) 1410 PRINT AT 20,c, INK 5; BRIGH 1420 PRINT OVER 1, INK 6;AT i,q, 1425 LET i=i+1 1430 LET q=q+1NT (RND+3) -1+13 AND q 30) -(3 AND q 30) 1440 PRINT OVER 1, INK 6,AT i,q, 'G" BEEP .01,15 D Q (1440 PRINT OUER 1, INK 6, AT i,q,
'G" BEEP .01,15
1450 IF 1 = 20 AND q = C THEN PRINT
AT 1,C, INK (RND + 3) + 4; "E": PRINT
INK 2, AT 10,2, "Oh dear!", INK 3,
"What a ", INK 2, FLASH 1, "HESS
"BEEP 3,5. BEEP 3,15. PAUSE 5
0 GO TO 1600
1460 IF (IN 65278<)255 OR IN 327
05()255) THEN GO SUB 1500 LET 1 P=|P-1 1465 IF LP = 0 THEN GO TO 6000 1465 IF (p=0 THEN GO TO 6000
1470 GO TO 1380
1500 PLOT INVERSE 1; C * 8 + 4, 17: DR
AU INK (RND * 3) + 4, 0, 148: BEEP .06
,12 PLOT INVERSE 1, C * 8 + 4, 17 DR
AU OVER 1, 0, 148
1520 IF (i) 2 AND i (20) AND q=C T
HEN LET SC = SC + 500, PRINT AT 0, 3,
INK 6, SC BEEP .04, 10: PRINT IN
K 6, AT 1, C, "E" BEEP .08, 2 PRINT
AT 1, C, "E" BEEP .08 , 2 PRINT
1335

1585 PRINT INK 4, FLASH 1; AT 10 3, "IDIOT!", INK 5, FLASH 0; "YOU let ", INK 6, "2 thro!" 1595 BEEP .8, 10 BEEP 1, 4: BEEP 2, -10 BEEP 1, 18. BEEP 1, .20 1600 GO TO 300 2000 BEEP .08, 19 BEEP .2, 10 BEEP .15, 15 BEEP .4, 25 FOR w=0 0 20 STEP 2 BEEP .1, w. BEEP .0; .4 NEXT w BEEP .4, 25: BEEP .1; .15 BEEP .2, 10 BEEP .8, 15 BEEP .1, 8 BEEP 2, 3 2010 BORDER 6 PAPER 6. INK 0 (L5 15 LS 2020 PRINT AT 10,4, FLASH 1, "You have saved Earth!"; AT 14,6, "CON GRATULATIONS!" 2030 PRINT AT 18,4, FLASH 0, "Pre ss a key to play again" 2040 PAUSE 500 IF INKEY\$="" THE 55 N STOP 2050 GO TO 2 4000 FOR n=0 TO 7 4100 READ A: POKE USR "A"+n,A EXT h 4110 DATA 255,255,192,192,255,25 5,3,3 4200 FOR n=0 TO 7 READ B POKE USR "B"+n,6: NEXT n 4210 DATA 68,99,50,59,31,31,13,4 4300 FOR n=0 TO 7 READ C POKE 4310 DATA 145,227,166,238,252,12 4310 DH... 0,88,144 4400 FOR n=0 TO 7 USR "D"+n,D NEXT n USR "D"+n,D NEXT n READ D POKE 4410 DATA 36,60,24,60,36,102,255 153 4500 FOR n=0 TO 7: READ E POKE USR "E"+n,E: NEXT n 4510 DATA 153,0,36,0,219,0,92,12 4600 FOR n=0 TO 7: READ F. POKE USR "F"+n.F NEXT n 4610 DATA 219,102,219,102,219,10 2,219,102 4700 FOR n=0 TO 7 READ G: POKE USR "G"+n,G: NEXT n 4710 DATA 153,126,90,126,60,36,2 4,24 4800 FOR n=0 TO 7. READ H POKE USR 'H"+n,H: NEXT n 4810 DATA 102,36,36,60,102,231,1 24 59,231 5000 RETURN 5000 PRINT INK 2, AT 10,1, "You a out of laser power!" BEEP! га BEEP 5,-30. GO TO 300

A semple screen illustration from the program, Hell's angels.



game

griming

uman

n the

move ve eft m row

THE

LAS

EFF

327

L p

DR

PR 8,5 c-1

70

50 = K

, AT

ø,

N G

10,

1335

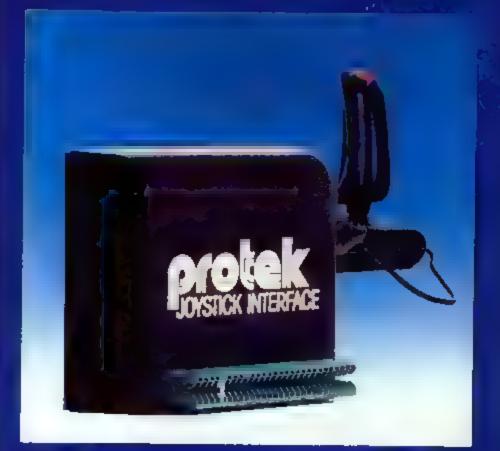
1550 RETURN

TO 1335

P

PLAY

Arcade Action For The ZX Spectrum



control for your Sincialr Zi Spectrum, you'll find the Protek combination hardle beat. The interface is compatible with a rangest software including a minin of titles from:

£9.95

ATARIA

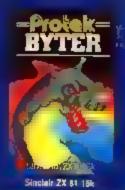
ULTIMATE, SILVERSON, RABBIT SOFTWARE, QUICKSILVER, QUEST, PSION, NEW GENERATION SOFTWARE, IMAGINE, OCEAN, plus many mon.

The protek joystick interface is simple to use. It just plugs in at the back of your Spectrum and is compatible with any "Atari type" Joystick Connector. We recommend the Spectravision Joystick at only £9.95 for Pistol Grip Joystick with a top and base fire button:

plus specially contoured shape and rubber suction cuit footing for single hand operation.

STOP PRESS + Mass computible milical















Wild west

Holster up and get ready to play this Spectrum version of the arcade game from R Page of Liverpool.

Based on the popular arcade game, this program is designed to be played by two people. Both players have control of a cowboy character each equipled with a handquin.

Fach character is placed to the left and right of the screen display. A road runs down the middle of the screen on which the occasional wagon will roll in to the distance. Beside the road are a number of cacti which along with the moving wagon provide cover for the two cowboy characters as they stalk their opposition trying to get a shot at each other.

Go for your guns

Each cowboy character can be manipulated around their own half of the screen through the four direction keys. There is also a key to fire your gun, which you press when you think you have a clear view of the other cowboy. All instructions are provided on screen as part of the program.

You will find, however, that your shots will not traver the entire width of the screen so there sind use you hanging back hoping the other cowboy will come out into the open and give you a clear shot this sind game for cowards!

As have said your character will not cross the road which bisects the screen display However should you wish to change this allowing your characters to wander allower the screen, you can always try experimenting with the values of A, B, C and Dinlines 620, 625 and 710.

To win the game, you must get five clear shots at your opporent. Once the game is over the winner siname will be displayed along with the option to have another game.

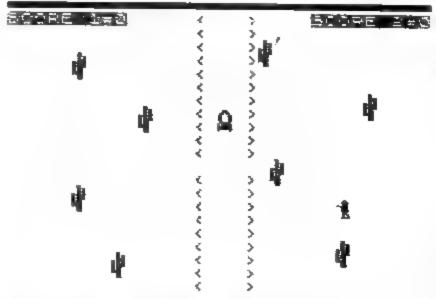
Line by line

The program is structured in the following way

Lines 10 50 Fire a bullet and detect if one of the characters has been hit.

Lines 90-200 Provide the instructions for the game unes 530 600. Set up the screen display unes 610 760. Detect the winner and also contain the main routine for the game.

Lines 770 830. Set up the user defined graphics and variables used in the game.



A screen illustration from the program, Wild west



REM 6186. She THELE TOR LIFE FOR R=(8+2) TO (8+18) 19 SCREEN\$ (C,D) ="." THEN 3 IF 59 15 TO 16 IF ATTR (A,R) =39 OR ATTR (A R) -33 THEN PRINT AT A,R-1;" " 16 17 PRINT AT A.R-1;" ";AT A.R. INK 7;".": NEXT A: PRINT AT A.R. 1," ": GO TO 650 20 RETURN 25 FOR R=(D-1) TO (D-18) STEP -1 IF SCREEN\$ (A,B) ="." THEN I TO 40 ATTR (C,R-1) -39 OR ATTR 33 1F (R -1) =33 GD TO /32 739 35 PRINT C,R;" AT NEXT R: PRINT RT C.R-1; INK TO 60 738 0 PRINT AT a, b; "IJ", AT a+1, b
. LET 52-52+1: BEEP .2, 20 B
.2, 10: BEEP .2, 15: PRINT INK 0;AT 0,31;S2. PRINT AT AT 3,6+1;" " GD TD 730 NT AT c,d;"KL";AT c+1,d S1=S1+1: BEEP .2,20. B PAPER 0;AT b;"";AT a, 50 PRINT AT 2,10: BEEP .2,15. PRINT INK PAPER 0; AT 0,8,51. PRINT AT GO 90 INK PAPÉR 2. 6. 4.5



100 PRINT " CHIED SEET SHOW 110 PRINT AT 2,1; "THE FIRST GUN SLINGER TO SHOOT HIS OPPONENT THE THE ONE TO SURVI VE THE GUNFIGHT" 120 PRINT AT 6,12; "20 TROS",
130 PRINT AT 8,4; "ELECT",
3,20, "20 PRINT AT 9,14; "ELECT"; AT 5 PRINT AT 9,14;" FIRE"; AT 11, "B", AT 11,15;" <> "; AT 11,17; "B 140 PRINT AT 10,8; "UP-0", AT 12,
,"DOUN-N", AT 14,3; "LEFT - 222", A
16,5, "RIGHT-2"
150 PRINT AT 10,20, "2-UP", AT 12
20," DOUN", AT 14,20; "ERTED-LEF", AT 16,20, "EREC2-RIGHT"
150 PRINT PRINT "YOU CANNOT PRINT PRINT PRINT YOU CANNOT SHOT IF YOU ARE A CACTUS OR THE HIDING BEHJ WAGON ON TH ROAD" RORD 165 INPUT "PLAYER UN 165 IF A\$="" THEN GO TO 165 INPUT "PLAYER TWOS NAME"; 6\$ TAPUT "PLAYER TWOS NAME"; 6\$ 166 INPUT "PLAYER TUOS NO IF B\$ -"" THEN GO TO 166 170 PAUSE 50 180 PRINT FLASH 1, PAPER 180 PRINT FLASH 1, PAPER 7, IND 2,8T 21,5,"PRESS ANY KEY TO BEG IN"

BORDER 4.

GO SUB /70

INK Ø.

PRINT

PAPER 7; AT 0,0; "BOOKE 15"; AT 0,23, "BOOKE 25"; AT 0,8; OVER 1; PAPER 7,51, AT 0,31; PAPER 7;52. DUER B \$40 FOR F=21 TO 0 STEP -1, PRI AT F,14,"<";AT F,18;">" NEXT PRIN 564 RESTORE \$65. PRINT INK 7, AT READ W, X, Y, Z PRINT INK 7, AT CHR\$ 148; AT Y, Z, INK 7, CHR\$ NEXT / 565 DATA 11,20,12,20,3,5,4,5,7,10,8,10,17,25,18,25,2,19,3,19,18,3,19,8,10,8,10,8,13,5,14,5,6,27,7,27,600 FOR 0-19 TO 1 STEP -.5. PRINT AT 0+1,16," "; AT 0+2,16," "; AT 0-1,16; INK 7; CHR\$ 144. PRINT AT 0,16, INK 1, CHR\$ 145
510 PRINT OVER 1,AT A,B; CHR\$ 145
510 PRINT OVER 1,AT A,B; CHR\$ 147
520 LET A=A+(IN 63486-190 AND ATR (A+2,B+1)-32 AND ATTR (A+2,B+1)-32 AND ATTR (A-1,6)-190 AND ATTR (A-1,8)-32 AND ATTR (A+1,B+1)-32 AND B(12)-(IN 65278-190 AND ATTR (A,B+2)-32 AND ATTR (A,B-1,8)-32 AND ATTR NEXT ATTR (A,B-1)=32 AND ATTR (A-1,B-1)=32 AND B>2)
630 OUT 63486,0. OUT 64510,0: D
UT 65022,0: OUT 65278,0 TI 545 PRINT AT A,B,CHR\$ 1,8;CHR\$ 147 647 IF INKEY\$="2" THEN GO TO 10 680 PRINT RT C,D; OVER 1;CHR\$ 1 50,8T C+1,D, OVER 1;CHR\$ 151 700 LET C=C+(IN 61438=190 AND A TTR (C+2,D)=32 AND C<19)-(IN 573 42=190 AND RTTR (C-1,D)=32 AND C 146, AT A+ 710 LET D=D-(IN 49150=190 AND A R (C,D-2) =32 AND ATTR (C+1,D-1 3-32 AND D>20)+(IN 32766=190 AND ATTR (C,D+1) #32 AND ATTR (C-1,D+1) #32 AND ATTR (C-1,D+1) AND D<30)
720 PRINT AT C,D;CHR\$ 150,AT C+1,D,CHR\$ 151
725 IF INKEY\$="9" THEN GO TO 25
730 IF S1=5 THEN PRINT INVERSE
1,AT 11,10; PAPER 7, FLASH 1,A\$,
"UINS" PAUSE 200, PRINT AT 13,
3, PAPER 7, "PRESS S1, PE, TO 5, 20
3 530 530 740 IF S2=5 THEN PRINT RT 11,10, PAPER 7; FLASH 1,8\$;" WINS". PAUSE 200: PRINT AT 13,3, PAPER 7, "PRESS 24, PE; TO PLA, EGATA": PAUSE 0. FLASH 0 GO TO 530, 750 NEXT O 760 PRINT AT 0,16;" "; AT 1,16;" 750 PRINT AT 0,16;" ";AT 1,16;"
": GO TO 600
770 RESTORE 780: FOR N=USR "A"
O USR "("+7. READ A: POKE N,A. TO USR 790 DATA 48,120,48,127,120,120, 120,48,80,144,216,0,0,0,0,0 800 DATA 24,24,27,27,27,219,219, 223,223,220,220,252,252,28,2 D =30 LET LET S1=0: LET S2 **= 0** 830 RETURN "UILD WEST!" LINE 90 1000 SAUE

200 PAUSE 0

PAPER 4.

530

C

N 3

. ca

R,

EP.

V 3

FR

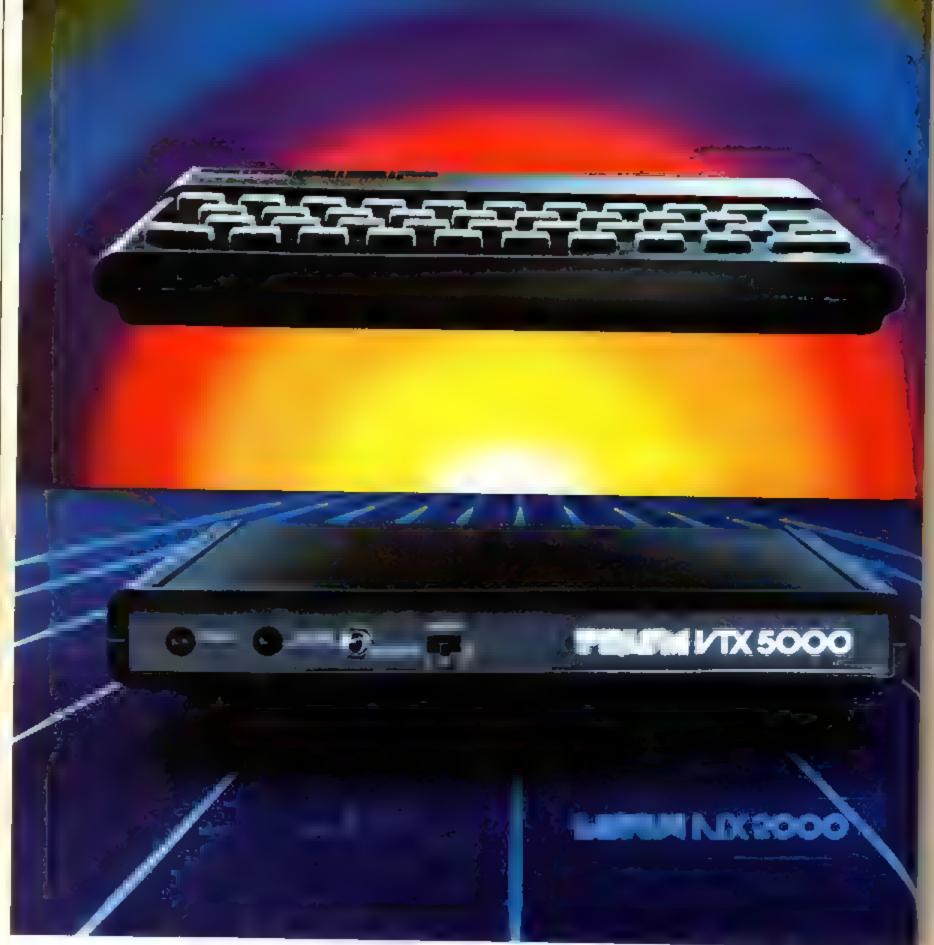
, ь, ВΞ

BÉ VK

3

NK AT 30

Ŕ,



offers the most so under the Spe

rcronet 800. The spectacular service Lathat gives micro-users access to a huge database of information, hundreds of software programs, and communication with other users.

Sinclair ZX Spectrum. The home computer that's out-shone all its rivals

Bring the two together and it's a combination that opens up a breathtaking new world of microcomputing possibilities

Suitable for either the 16K or 48K versions, the Prism VTX 5000 modem was designed specifically for the Spectrum and fits neatly under the micro

Plug the other end into the outside world via your telephone and your system will give you more than you ever dreamed

> To other Spectrum

> > Spectrum

VTX 5000

MSCTS

possible.

Micronet 800 is fun, friendly and inexpensive to run. Choose from dozens of free games, download and use them on your Spectrum whenever you like, play onscreen games (as easy and inexpensive - as a local phone call), and compete in Big Prize

games and quizzes There's also a range of downloadable games you can buy for less

than over-the-counter prices.

Learn through up-to-date education packages, and help run the household with simple business packages.

And if you need fast facts about the world of computers, Micronet 800 provides constantly up-dated product comparisons, reviews, prices, dealership and 'best-buy' information - 24-hours a day, 7-days a week.

You can also access the full range of Prestel information covering news, travel, holidays and entertainment, together with an electronic booking service.

Keep in touch you can send electronic mail to any other Micronet 800 or

Prestel user.

Micronet 800

The VTX 5000 provides a full Prestel screen with graphics, and an off-line message composition facility for speedy transmission when you go on-line

You can use the Sinclair printer to print

frames and messages, or save them on tape for future use.

All this-and even more as the service grows - retails at the low price of f.99.95inc VAT.

Plus, as a special offer to early users, we will provide you with a jack-socket installation (should you need one) completely free of charge.



Micronet 80 ectacular

Please send me a complete Micronet 800 information pack containing details of Micronet 800 and the VTA 5000, and including a Micronet subscriber's application form No. VIX 5000 moderns at £99 95 each me VAT I enclose a cheque made payable to Telemap I td for £ I wish to pay by credit card. Visa, Access. Diners Club. American Express. Delete as applicable) Amount L L X 12 Signed My credit card No. 5 Name Address

Micronet 800, Scriptor Court, 155 Farringdon Road, London EC1R 3AD, Tel: 01-278 3143. One of the many faces on Prestel

arges.

Holmes occinves investigates

Short Vowel Sounds — Sherston Software

Short Vowel Sounds alke the ones in cAt in that and pOt) are the subject of this educational cassette from Sherston Soft ware.

The program itself is divided up into three sections which test the young child's ability to recognise an object shown on the screen and then choose the correct vowel sound from a choice (for example, cat cot cit cet cut)

in the first section, the child is only rewarded by a large tick. and a bleep for the correct answer which is a little disappointing a happy cartoon character or something of the like would be a bigger noon tive to do wel. The second section consists of the child having to complete a sentance the picture on the screen indicating the correct word. Again the child chooses. the correct answer from a selection of possibilities

Overall the program is good enough for use in primary schools and reasonably priced at £7

Firework Music — Software Cottage

This program is another educational package a med at teaching the notes and their positions on a musical score it is split into two programs one for the treble clef and the other for bass.

The user is first shown where all the notes lie on the stave then has to commit them to memory for the test. It consists of a musical note being shown and the user having to name the right note before a burning cinder falls into the firework box on the screen and destroys them. The more notes that are named, the

Paul Holmes inspects a number of new software packages for the ZX Spectrum.

faster the cinder falls. After naming ten notes there is a mini fire work display which will probably entertain users in the younger age brackets.

The screen display of the stave, cref and notes is sufficiently large so that if it were displayed on a large TV in a classroom, the whole class would be able to see it. The program is bug free as far as could tell and seems a useful tool for teaching one of the more basic points of music to a fairly young age group immany in the Juniors and Primary school.

Overal very good value for f 5 00

Music Maker — Bellflower Software

Being somewhat musical myself loaded up this program hoping to find something to lighten up my life. After choosing my key and time signatures from eleven major keys and twelve times) I eagerly entered my first tune.

Nice graphics" thought However I found some aspects of the program a little limiting leg no notes shorter than a quaver were allowed and was restricted to bet ween middle C and the G an octave and a half above. Tied notes were also not catered for which could prove in convenient.

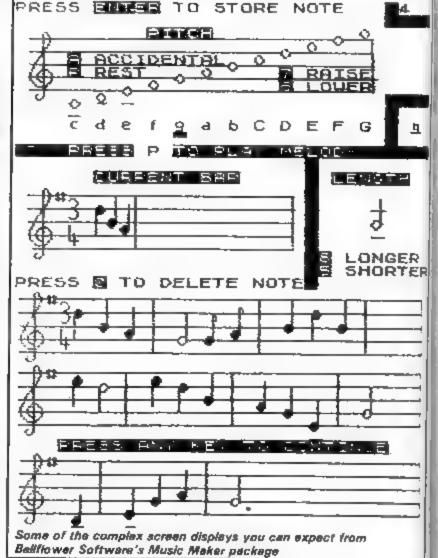
The documentation (which included three sample tunes), seemed a little educations in style which may account for the above shortcomings. The feature that I found most annoying though was the fact that I could only delete the most recently entered note, which I needed to do more

than just once. One other odd point was that the program seemed to avoid putting accidentals on lines instead much preferring the space immediately above or below, which looked a little messy.

So pressing the pikey to pray, sat back to hear so meone eise's melody echo in my ears only to be rudely awakened. Again good graphics but the tune! Every time the program drew a bar line there was a very audible.

pause Quavers were out of time too, the program could not draw tham fast enough and every time the program fill ed up a screen there was a pause of about two seconds while it cleared screen and redrew the three staves. Sure va. I ttle machine code could have been used here, or falling that not everyone oves the 2801 the music could have been printed first and a pointer moved along in time. This fault I am sorry to say makes the program a most unusable which is a pity considering the graphics and the need for such i a program

In condusion, this package would not satisfy those who seriously want to make music



Grasb **Camel Software**

approached this package with a little apprehension least because of the rather dubious name , since have had imited experence with business, scientific programs

it turns out to be a graph plotter capable of drawing line gaphs histograms and pie charts it is also capable of drawing multiple graphs on the same or different axes, and has the facility to expand and contract graphs, thus allowing inset graphs to be created with histograms, four different types of shading are allowed and with line graphs, you can adjust the length of dotted line between points or you can choose to have a solid line or no line at a . Each set of data is called a dataset isurprise surprise and may contain up to 100 tems each and any dataset can be used for either

ut of

cou d

ough

as a

onds

id re

reya

have

that

7801

been

anter

This

iakes

able

g the

such

kage who

USIL

ER

The documentation s generally good, although found it a "ttle confusing n some places, especially when referring to control characters in the interactive mode more of which later. Another part which found rather unclear was the sect on on data entry which seems to have been hastly skipped over ralthough most of the essential facts are there and it didn't take long for me to grasp hmmm the principle of operation. The manual is not suitable for the beginner whether in computing or statistics, but anyone with a small knowledge of both is adequately catered for A worked example would have been useful though

Obvious y the best way to evaluate a package of this kind is to try to create some graphs with t So off went test data in hand to try and create my own graphs. After reading the documentation thoroughly ! loaded the program found the menu page somewhat clut lered but soon got used to it. It did take a trie while to redraw everyt me I made a major change or when returning after drawing a graph So, on pressing the 1' key to enter date entry mode, the user is presented with nine options, including facilities to list add, modify and delete entries, as wer, as the rather powerful facility to create datasets using all the functions that the Spectrum can handle leg sines, casines logs etc. There is also of course a straight

COS (x) SIN(x) Some example graphical displays obtainable from Camel Bafturaro's Gresp.

ine fit facility for y mx+c although considering that quite a few scientific calculations will do this for under £25 one might have expected y=mx for functions that must pass through the origin) as well as fits such as y axe or y = logx since there are found in guite a few relationships in Physics and higher Maths. Then again, whole programs have been written to do only these functions, so perhaps it is asking too much to see them included in such a general piece of soft ware as this

Pressing 'e to exit from this sub-menu, we were returned to the main menu again. After setting up the many and varied options available to me, eg PAPER INK and BORDER col ours position and size on screen sold or dashed me, shape of plot points, number of ticks' on each axis, pressed the '2 key for DRAW The graph was drawn tolerably quickly, although when the fill

option was used leith in the line) on arge graphs it could get rather ong winded and there was no facility for break ng into this routine and getting. back to the menu in one piece. which was especially irritating if you not ced that you had misichosen one option since you had to wait for the graph to be drawn before you could

go back and change it

After spending about an hour familiarising myse f with the package, I found it quite easy to create both graphs and histograms, but although I tried quite hard for some reason I couldn't even get the shadow of a pie chart, let a one the real thing. Once your diagram has been created, you may go into interactive mode which allows you to move graphs around (great fun and useful too!) change colours, erase bits add text and generally play around with your masterpiece until you are satisfied with it.

In conclusion a very wor thwhile program which I highly recommend to anybody who requires such facilities for home school or business.

Macro Construction and Animation – Pinehurst Data Studios

This is one of the mist original ideas for a piece of software I have seen yet it is designed to launch the user into the world of Computer Movies' WE. that is what they cam though I would describe these as Animated stories' than anything else

It comes complete with a well written manua and demonstration 'Movie' Though the graphics are not up to the latest arcade standard the package is not designed to be the latest video game at is a fun' dea that I found quite entertaining to use and on the whole the program does the

task very well

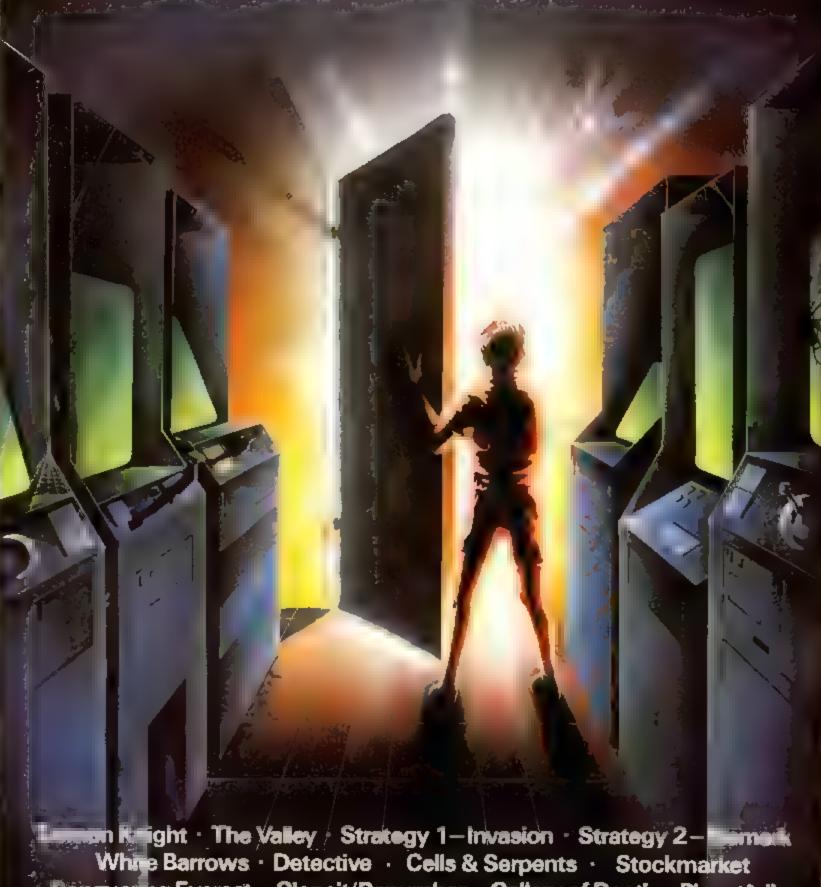
The sequences are built up using a selection of com-mands. The most common command is the Cast command which allows you to call up any member of the cast includes men women a dog a bird, a helicopter and many others) and make it move around or across the screen it also has a number of other commands a lowing the 'Direc' for to build up objects such as houses or to display their standard sun, or a horizon. An interesting feature is that the movie maker' can store tunes and play them back at key points in the story. There is a command which allows text to be printed on the screen which is useful for representing speech by the characters On the whole the program is very versatile and if found it an entertaining change from the usua shoot em up' game

The cassette is produced by 'Pinehurst data studios (sounds suspiciously like Pinewood film studios doesn't t? and sels for £7 Good value, with lasting appeal





A STEP BEYOND THE ARCADE...



Conquering Everest · Cloneit/Renumber · Gallery of Death · Planetfall



ASP SOFTWARE 145 Charing Cross Rd, London WC2H OEE Tel: 01-437 1002

Now available from:

Tellurd Electronics inside Bambers Telford Town Centre Shropshile

ighe W Bagnall L (d 18 Salter St Stafford ST16 2 JU

7 Anley St St Helrer Jersey

Computer Cabin 24 The Paracte Silverdaie Newcastic Statis

Software City Turblield Passage Walvethampton W Midwinds

DAComputerst d 104 Longue Rd Picester LE 2002

Fal Sofilium nipurers 85 Georges Arriada Falmourh
Conwall TRIT 3DH

Star apper inc. 234 High F

William Smill Booksellers of university Bijokshop White Knight's Beauting RC & JAH

Theta Shop 163 owers akhill Road S 11 port

Conterbury Soft Ward Centre Canterbury Ren CT: 2AS

JCV Organisation ⊾1/1 WhatESt CV 34 5EO

the Diayon Dungeon Ashbourne Derbyshire DF 6 AQ

3D1 omputers . In 230 Talmouth Rise South Surbitari

Vision Store 96/98 North End Craydon CAD 15D

Philip Copley Hi F. L. d. 6 Wisley Street Mond Court Osser t Waker jeld N Yorks

7 Broad Street Вцгу

4 Mai Computing 67F hargate Prescon Lancs

Channel 8 Software Ltd. 51 Fishergate Preston

Windsor Computer Centre Thames Avenue ฟ้ากปรอก

Rush Hi F & Video 5-6 Combill Chelmsford Essex

Amersham Computers 18 Woodside Rd Amersham Bucks

Cadtreys 30 East Walk Basildon

Estuary Software Products 261 Victoria Avenue Southend on Sea

Software Cantre 128 Wigmore St W1

Dimension 27 29 High St ∟0:čéster

Vic Oddons 5 London Bridge Walk London SE 1

Computer Plus 2 Church Lane Barbury Oapn

NPC ameion & Computer Shop 2a Kings Parade Cambi dge

Certifine actionics 50 Newton St Manchester

She woods Photographic and 113G Weste n Arcade Birmingham 82 SHU

∄ ainwaye Micros crd ∠4 Crown St Suffork TP1 2LD

Micro Business Ceritie Ltd. 17 19 chheld St. Wolve hangtor WVT EA

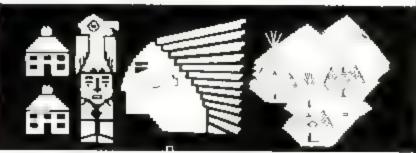
Trend & H F Video 167 High St Walthamslow London E 17 9PD

Eddy's Notine aid ENL Audio visual 115 118 Alf eton Rd Nottingham NG 7 3NR

Cannock Computer Systems . Id 18 Old Penkridge Rd Cannock StaffsWS1MZ

CBTV H F & Video Sales & Service 59 Tamworth St Lichfield

SPECTRUM & ZX81 **EDUCATIONAL SOFTWARE**



CALPAC LEARNING SERIES

ise ou. Compine Assisted Learning PA, iks to help you ich idien with her school work. The programs in the series use moving folial graphics and sound it likke learning more enjoyable. Each pack contains thur programs and is suitable to use with the TRK in 48K Spectrum. Program notes are supplied

VOLUME 1 (from 6 years) Tens and units addition and subtration with detailed help addities powerful days use drawing program English comprehension applies to American India is Solve to Spelling resist with beasy entity or your own is a textine able this or not huphones. 19.50 YOLUME 3 (from 9 years) Nouns veins adjectives and advertis enses of verbs blougy of helpower song lession from 19.50 Additional features of the CALPAL HARNING SER ES holide. Spelling checkers. Help callup or the tasky insertion is subject in a erial of your dwn their earlier to he programs.

CALPAC C1 O-LEVEL CHEMISTRY Four clearty prosented evision lutorary ligrams. The subject maler has been relevally short ed to cover he most important aspects of the ements compounds and mixtures to a literature bonding and projecties. Redox elem plysis and the activity series • Acids bases allo salts 48k Specium and 46K ZX8 versions he classette are available Please specify which you require Our surfwere slaveliable by direct mail from

CALPAC COMPUTER SOFTWARE

108 Hermitage Woods Crescent, St Johns, Working, Surrey GU21 1UF
Fortunities details please elephons 1948 67 2584 Wichard a demonstration casserio avallable or relaters or schools

campoel systems

MEN! WITH MYRIDON'S WITH MYRIDON'S up to 51 columns

Masterfile Spectrum 48K YES - Microdrive compatible!

Acclaimed as the definitive fling system for the 48K Spectrum MASTERF LE'S machine coded flex bill ty gives you 32K (max) per file 26 fields per record up to 128 characters per field multiple level searches for numeric or character comparisons data presentation in any one of 36 user defined displays which may be sequenced by any field - USER BASIC for tailored processing " the most comprehensive of the data-bases Sinclair User June 1983

With example file and detailed manua E15 00

Spectrum rawmaster 48K

DRAWMASTER is the ultimate DRAW AND PAINT ut ity for the Spectrum compose your own HIRES pictures with 8 direction 2 speed hand draw keys fast fill enlarge reduce facility for all or part of the screen plus all the Spectrum colours and attributes over 50 commands in all

With detailed instructions 66.95

AN DISPLAY

Spectrum

DLAN dee lan', DISPLAY LANGUAGE is a powerful machine coded interpreter for generating DYNAM CITEXTUAL DISPLAYS for advertising and education — all commands are single latter or symbo - with 4-way scroll of 11 type-faces through user defined windows.

With detailed manual £7.95

All programs mailed 1st class by return Prices include VAT and postage within SAE for full list

Dept (ZX) 15 Rous Road, Buckhurst Hill, Essex, IG9 6BL England 01 504 0589



It's easy to complain about advertisements.

The Advertising Standards Authority. evertisement is serong, we're here to put it right.

ASA Ltd. Brook Hinuse, Torrington Place, London WCIE, 7HNL

University Software LIBRARY OF ADVANCED MATH/STAT/ECON

TAPE 1: MATRIX OPERATIONS

SPECTRUM 68.05 ZX81 53.89

Side A. Inversion multiplication, addition subtraction and scalar multiplication of matrices and vectors within one single program. Any output can in turn be used as the imput of he next operation without re-typing Capacity no of rows kind of columns. SK 2X81.25x25.16K Spectrum. 17x, 7. 48K Spectrum. 48x48.

Side B: Determinants of squale matrices.

TAPE 2: POLYNOMIALS

SPECTRUM E6.95 ZXE1 E5.96

51de A. Includos quadratic equalions las degree 2 polynomials; and Newton Raphson and half interval segret methods for higher degree polynomials. Computes the roots with

9164 B: You can plot polynomiats in any interval and examine they roots, extremum

TAPE 3: INTEGRATION

SPECTRUM E6.95 ZX81 £3.86

\$100 A. Integration of functions by Simpson's and trapezoidal rules. Also computes the area enclosed by wo functions. **Ide 8** Plot of integrals integration can be visualised on the screen

TAPE 4: REGRESSION

SPECTRUM E7 95 ZX81 E8.00

Side A: A highly developed multivariate regression program featurity to 2x51 18.8 a each variable thus allowing exponential and geometric regressions). Riscorrected Ristandard errors statistics of statistic degrees of tracdom. Durbin Watson statistic inforpolation Capacity no chivatables into of observations 16K 2X81 2x500 5x250 10X 40 6K Spectrum 2x290 5x100 0x50 48K Spectrum 2x 800 5x500 0x500 8x466 B. Plot of bivariatio regressions You can see how your computer draws a best inting time on a set of numbered data points.

TAPE 5(a): LINEAR PROGRAMMING

SPECTRUM 17.95 ZX81 £6.85

Side A. A user friendly infirmisation program capable or handling all sorts or linear programming problems any combiner on of ≤ = ≥ constraints and xi≥ xi≤0, each size the cannonical equivalent of the primar values or sack variables and herdia Flapsony no rilivariables and constraints. 6k x x81 0×23 5×20 20× 5 6k Spectrum 0x10 48k Spectrum 10x50 25x40 50x30 Side 8: Solutions of simultaneous equations.

TAPE 5(b): PROFESSIONAL LINEAR PROGRAMMING

Available for 6K ZXB and 46K Specium with above restures plus save-cara and change data racilities. Any single data entry can be changed in order to observe its effection the solution.

- All inclusive prices for the JK ...
- Tapes 1 5(a) Spectrum £35 ZX81 £30 Cheques payable to

UNIVERSITY SOFTWARE

29 St. Peter's Street, London N1 8JP.

MICRODRIVE COMPATIBILITY

BALARE

Programmable interface blooding at diga-tograde, imagines with clips on program many leads. Self-substitute programming many disculting

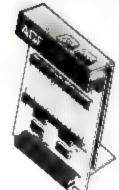
register, irregister into cripton programming lands.

Self-subscription-revenue meri decilled historie in define which here is associated with the land on in the case of route comparison. If it is also and it like the contraction of the land on in the case of route comparison in the case of route comparison. In the case of some fact what desirable revenue presented planes and west-cross-large reveal. One case for the factories are in read.

One case for the factories reference of the period of the period of the factories and the case of the factories and the case of the factories and the case of the

GRAMMABLE **ZX81**

the AT Proof destarts beyond a limited hand to the AT Proof destarts beyond a limited and a support of the AT Proof destarts and the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and the AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts and AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Proof destarts are also as the AT Pr



REVIEW MIRE

FORTROLLERS

POR USE WOTER OF THE POTTER ACT

Module of VIC 70, Commission 64,

ALEX VCE, Anni 400, Alex 800

ock Precions apagosphi to po do note deficie procedulate seador	Forgranding and little	Cypyli Stall a lindpathies Pth, We warfighter Qual b Mill Let Neth els deal itelanti inmediate for all sel sal- idd-inter. direction groups and sentral lends. Procedure of the sentral groups and sentral lends.	CHILD TO SE	ira ise make for sen eniquir supe sejen se seje i ipe VAT • PAP LDERS CONFIRMI
FROM MR	/MRS/MISS			
ADD/RESS				
	O NO STAMP NEEDED! I, BOOKD# REGIS WEST	TO AGE HARDWARE DERT Z	A CEM PRICE	TOTAL
	PROGRAMMABLE	INTERFACE	12).95	
	10 Y S 1 DR (5)		7.54	
	BACKISI GIZICK BA	FERENCE CARDS	άά	
ONE	V DED GRAFFIT		FRIEE	

JOYSTICK INTERFACE II ectru REW PRICE AGE COMPATTILE SOFTWARE AVAI (411) As measure

IPPOSTUTE INTREPACE

The immediate Medable II has been opecally designed to play on in the even immediate of some 25th Specification in 25th Specification in 25th Specification in 25th Specification in 25th Specification in 25th Specification in 25th Specification in 25th Specification in 25th Specification in 15th Specification in 25th Specification in 15th Specification

Des sament selfmans schrigening.

4 across describes sens for eigenschaften für Floring in gestellt und der eigenschaften für self ander eigenschaften der gestellt und ander den der eigenschaften der gestellt und ander der eigenschaften der gestellt und der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der der eigenschaften der eine der eigenschaften der eines der eines der eigenschaften der eines

FROM MRAMMSANISS



BENDOW O IND STAMP NEED (OF O A D. MARDWARE DEPT ZXC PREEPORT BOGNOR REGIS WEST SUSSEX POZZ BBR

Of Y (TEM

INTERFACE MODULE JOYSTICKISI SOF TWARE

SOFTWARE ZAIGPECTRUM L CR. LIKE ADDORES WENCHAUL

E AVORT PRICETOLS APPLICATION
WHERE TO HAVE ACC PRODUCTS OVER THE COLNIES
HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST COMMANDS
1 HOST Authly Christian Certice

In Last Heart Streen, Schillenber

In Last Heart Streen, Schillenber

In Last Heart Streen, Schillenber

International Life and Product International

International Company (Internation Product) International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

International Company

Internat

Commercial Commercial

TEM PRICE

7 54

Part companies surjective and in the second of the second

98

Window shopping

The Sinciair range of computers must be the most well-supported range of microcomputers in the world. And not least by Sinclair Research themselves especially as they now provide not only the ZX Printer and RAM pack, but also the Interface 1 Interface 2 and ZX Microdrives

95

50 50

пů

However alongside these pieces of equipment, there is a wealth of hardware produced by independent companies which when added to your micro can make for a very substanta-

size, we can only really hope to stratch the surface of these devices. But, hopefully we can provide enough information to help you decide the areas you would like to expand your system to include and perhaps some of the companies you would like to include on your shortlist.

If you're thinking of adding onto your ZX81 or ZX Spectrum, why look any further than our comprehensive hardware features?

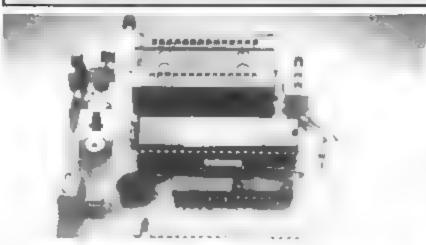
This feature is not really so much of a review, but more of an expanded checklist. So, while some products may only get a small mention, this is no real reflection of the quality of that product. Rather, you should use this article as a springboard for the future expansion of your Sinclair system

Hopefully, in future issues of ZX Computing we will be able to



n Brief

- The Orme Electronics EPROM Card for the ZX Spectrum can be used to provide more facilities for BASIC programs. With the EPROM fitted in the Spectrum's ROM space you have 10 extra routines for re-numbering, editing, character manoeuvering, and variable dumping. Designated EPROM 1, the device is priced at £9.95. For further details contact Orme Electronics, 2 Barripper Road, Camborne, Comwall TR14 7QN or 'phone 0209 715034.
- The MZ-8 is designed to interface with the ZX81 and has two functions controlled by on-board DIL switches. Firstly, it provides storage of up to 10 programs in BASIC and or machine code up to a total of 6K, and secondly the device provides 6K of extra memory. Software is provided in a 2K EPROM and gives a monitoring facility whereby system status is displayed on-acreen. Priced at £44.90, you can find out more about the MZ-8 from Micro-Z Ltd, PO Box 83, Exeter, Devon £X4.7AF.
- Specspansion is a combined four slot motherboard and 24 line bi-directional programmable port board for the ZX Spectrum. The device plags directly into the rear connector of the Spectrum and provides facilities for other peripherals to be added. Priced at around £30 for the complete package, you are also provided with a software programming aid on cassette. There is room for four additional cards, which the makers are expecting to produce in the future. For more information contact f B Tronics, Unit 2, Park Brook Industrial Estate, Park Street, Lye, Stourbridge, West Midlands DY9 8SS.
- You can upgrade your Spectrum, either issue 1 or issue 2, from 16K to 48K using a RAM kit from Delta Research Ltd. Free with each RAM kit comes Delta Chipchek, a memory diagnostic cassette providing computer standard testing of the existing 16K RAM and the 32K extension. The issue 1 RAM kits are priced at £37 and the issue 2 versions are priced at £31. For more information contact Delta Research Ltd, 15 Church Street, Basingstoke, Hants RG21 1QG or 'phone 0256 69345.



Add-on accessories – EPROM Services A

EPROM Services have a wealth of add on devices for both the ZX81 and the Spectrum

Priced at £19, there is the EPROM board, which can accommodate up to 8K or 2K EPROM or 2K RAM Cs. This memory is located at 56-64K, but with simple modifications it can be made to relocate the board to the 48K area. They also make available an Auto Start unit, priced at £9.95, which gives an automatic jump to location.

FDOO Hex on switch on

For the ZX81 there are a plethora of EPROMs available, priced between £9.95 and £19. These can be used for rapid LOAD SAVE tool kit, disassembler graphics control, character set, monitor and other uses.

However, EPROM Services are responsible for much more hardware than can be briefly mentioned here, so it might be worth you giving them a buzz on 0532 667183 or writing to them at 3 Wedgewood Drive, Leeds LS8 1EF, if you are looking for a particular application.

Firmware, etc

Add-ons - Haven Hardware

Haven Hardware have a great selection of add on boards for your ZX81 or ZX Spectrum

For the ZX81 there is a programmable character generator, priced at £15.95, a repeating key module priced at £3.95, an inverse vieo module priced at £3.50, a keyboard beeper, priced at £6.95, a keyboard entry module, priced at £2.95 an input output portipriced at £11.95, a £ul size keyboard, priced at £18.95, and

many more. You can also obtain these kits as fully built unit although you will have to adabout a quarter of the price again.

Haven Hardware also provide devices for the Spectrus including and O port which has eight inputs and eight output accessible via edge connector on the edge of the pcb. This is priced at £12.95 for the kit or built for £16.95.

For further information get in touch with Haven Hardware at Asby Road, Asby Workington, Cumbria CA14 4RR or phoni 094-686-627

Expansion Bus – U-Microcomputers ▼

J M crocomputers have ntroduced two new interface cards for their expansion bus system

The USP 232D, priced at £34 50, is a powerful dual channel seria interface utilising the soph sticated Z80 DART chip. Software included comprises an LL ST and LPRINT patch, and dumb terminal emulator. You also get a 56 page manual.

The JSP O is a generical purpose parallel interfacilitising the Z80-PIO chip This card provides 16 input or output lines and four control lines. Applications include connecting to plotters, music synthesises, D A and A D converters and a course, printers. The JSP I Oil priced at £29 90.

For more information on the and the further cards available get in touch with Uniters and Microcomputers and Winstan ey Industrial Estate Long Lane, Warrington, Cheshire WA2 8PR or phone 0925 54117





FORTH - David Husband

btain

add

gain

ov de

trum

h has

touts

ctors

his is

rbu lt

et in

e at 4

gton,

hane

eneral

face

This

Ltput

nes

ection

rd of I O is

these

lable,

w th

Ltd.

state.

iton

hone

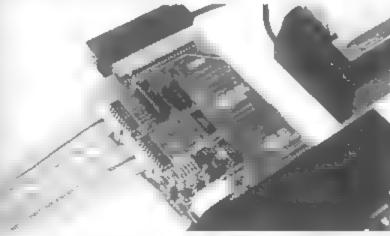
1984

David Husband has come up with an interesting concept for the Spectrum—a ROM cartridge containing 12K of Fig FORTH a full RS 232 interface via an 8251 and 24 bits of parallel 1/0 via an 8255

The BASIC ROM is switched out and replaced by the FORTH ROM which contains all the standard Fig-FORTH words. The device also offers a multi-tasking FORTH operating system, a Z80

assembler for machine code FORTH definitions a terminal routine to support a modem a crystal controlled baud rate generator for the RS 232, a machine code monitor RS 232 and Centrolles and 4K or ROM for future software enhancements

The retail price of the package is £59 + VAT For more details contact. Day di Husband 2 Gorieston Road, Branksome Poole BH12 1NW Telephone enquiries can be made on 0202 764724.



Time Controller - Gianmire Bectronics ▲

Consisting of a battery backed real time clock, the Time Controller has eight programmable inputs and eight programmable outputs.

With its own built-in program.

In PROM only a single instruction is necessary to read or write the month day, date, hours in nutes or seconds. There is also an extension connector should you wish to

add other peripherals onto the board

Applications for this device not ude leactronic diary with alarm, home control, burglar alarm sound effects and process control.

The prices of this device are £34.50 for the ZX81 version and £38.50 for the Spectrum model

For more information on the Time Controller contact Glanmire Electronics, Westley House Trinity Avenue, Bush Hill Park Enfield EN1 1PH Telephone enquiries can be made on 01 366 3245

MUKBUS - Microtext >

The Microtext MUKBUS Card frame System plugs into the Spectrum's rear edge connector and fully buffers the signal lines entoasix slot motherboard. With this unit the Spectrum enthusiast should be able to make use of the full range of MUKBUS interfaces, as well as use their prototyping card which can be used to build any interface or computer project, you can think off.

Also compatible with the card trans, Microtext offer a power

supply capable of powering the Card Frame together with interfaces Spectrum and two micro hoppy disc drives

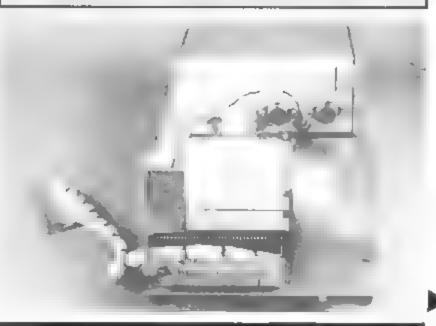
The Card Frame is priced at £59 95 and the power supply is available at £39 95. For more information contact Microtext UK Ltd at Highland House 20-24 John St, Luton, Beds or 'phone them on 0582 418894. You might also like to ask them about their new range of printed circuit cards, including floppy disc, RS 232. Centron as 80 column video. 64K page mapped memory and bar code reader interfaces.

Stephen Adams has come up with a number of interesting devices for the ZX81 and ZX Spectrum. The Straight Adaptor. converts the Spectrum to the same expansion port as the ZX81, but does not do any address conversion thus providing you with a full 64K of addresses when the printer is being used. He has also developed the Adam and Eve Adaptors. The Eve Adaptor allows owners of the 48K Spectrum to utilise the wide range of ZX81. peripherals (as long as those devices operate in the 0-16K section of the ZX81's memory map. The Adam Adaptor simply allows you to add a Sinclair compatible RAM pack to your 16K Spectrum, thus doubling your storage at a stroke. The Adam I Adaptor, an update of the Adam Adaptor, allows the use of two sets of peripherals at the same time on the 16K Spectrum. All the adaptors are available at £9. For the ZX81. Stephen has developed a programmable tape controller, the RZ1 for the Spectrum and ZX81 As well as not having to change the leads as you are SAVEing and LOADing, the cessette motor is set under program contro. The price of this device is £20. For further details contact Stephen Adems at 1 Leswin Road, London N16 7NL or 'phone him on 01-254 1869

The interface board from Interceptor Micros Is designed to connect a standard Atari type joystick to the ZX Spectrum. There are two positions for loysticks and there is room for further periphera expansion. Instructions are provided with the package to help the user check that the board is working up to the correct standards, and a software demonstration tape is also included. Priced at £15.95, you can obtain more information from Interceptor Micros, Lindon House, The Green, Tadley, Hants.

■ JRS Software have on offer a number of ICs which transform your Spectrum from 16K to 48K. The first issue Spectrum can be upgraded using a RAM board which is fitted inside the computer Requiring no soldering, the RAM board is priced at £42.50. For the issue two Spectrums, there are 12 ICs provided, marked A to E which are to be fitted inside the Spectrum, replacing ICs a ready in position. Installation is carried out simply by following a diagram supplied. The price of the ICs is also £42.50. JRS Software can be contacted on 0903.65691 or by writing to 19 Wayside Avenue, Worthing, Sussex BN13.3JL.

For issue two Spectrums only, there is a Spectrum upgrade to 48K available for only £24.50. For further details, get in touch with Fountain Computers Ltd, Darvill Road, Ropley, Alresford, Hants SO24.0BW. You could also ask them for their instructional sheet concerning the way to get the best out of the display of the Spectrum. Priced at £1, this A4 sheet shows you how you can get a marvellous display simply by adjusting a few internal controls of the Spectrum.



Brief

The Fuller 16K RAM pack is designed to fit onto the back of the ZX81 and is priced at £24.95. You could also investigate the possibility of utilising the FD Motherboard then you could have a 16K RAM card or a 64K RAM card added to your system. For further details contact Fuller Micro Systems, The ZX Computer Centre, Dale Street, Liverpool 2 or 'phone 051 236 6109

The 16K RAM pack from Data-assette is priced at £28.96. You. can also purchase a plug-in module for your ZX81, which when used with the RAM pack will expand your memory up to a full 32K. The price of this unit is £29.95. Further information is obtainable from Data assette, 44 Shroton Street, London NW1 or you can 'phone 01 258 0409

A floppy disc controller for the ZX81 offers single or double density compatibility with all Shugart 5% inch drives, the new Japanese 3 inch drives and the Hungarian MCD1 3 inch drives Set to enter the market at around £40, you can find out more from Analogue Information Systems Ltd, 43 Gilmour Road, Edinburgh 16 or by telephoning 031-667 6862.

Technology Research Ltd have announced the availability of a floppy disc interface card for use with the Spectrum which will work with any Shugart standard disc drive or with the new Micro Disc 1 drives. Further details are available from Technology. Research Ltd, 57 Brockley Rise, London SE23. Telephone enquines can be made on 01 699 5332

 Audio Computers have introduced a RAM peck, priced at £19 95, for the ZX81 to make it up to a full 16K. The upit incorporates feet to make it up to the same height as the microand has a plastic grip which hangs over the top of the ZX81 holding the RAM pack in place. For more details on this device, get in touch with Audio Computers at 87 Bournemouth Park Road, Southend on Sea, Essex or telephone them on 0702



Memory

Arab RAM Autoram v

Here is a device which when fitted between the 2X81 and a RAM pack will provide the user with a complete set of characters, keywords and functions in an Arabic version of BAS C called Saudia

The new language is set with well designed character shapes providing good egibility on the screen. Arabic equivalents to all the keywords, functions etc.

have all been carefully chosen and special keyboard overlays an available with the device with the various words converted for the new language

All the ZX81 performance features have been retained, even though the writing occurs from right to left and decimal numbers are evaluated from left to right. An easy to follow instruction book et is provided as part of the package

The manufacturers of the Arab RAM can be contacted at PO Box. 147 Jeddah, Saudi Arabia



RAM Packs Stonechip Electronics

From Stonech p Fectronics comes the ZX Panda, a 16K RAM extension for the ZX81

Housed in a sturdy box, the pack connects to the rear of the 81 via a tin-plated edge connector. There is also an LED built into the unit to indicate that power is reaching the RAM pack

There is no extension connector at the back of the

device, but it is possible to adda further 16K inside the box with: RAM board priced at £14 50.

The ZX Panda is available from Stonechip electronics, priced at £19 95. at Brook Trading Estata. Deadbrook Lane, Aldershot, Hants GL12 4XB Telephone enquiries can be made on 0252 318260.

You might like to also ask them about their other add ons for the Spectrum including a light per, echo emplifier programmable joystick interfact and a keyboard

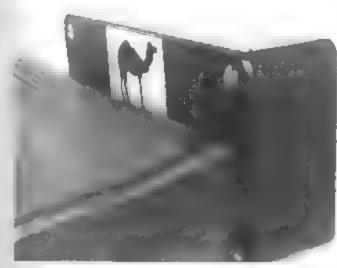
RAM Packs - Memotech ∢

Memotech provide a wealth of hardware add-ons for the ZXB1 including a number of memory

Called Memopaks the units fit snugly onto the back of the '81 and can be stacked together to further enhance your micro system To simply extend the memory capacity of the ZX81 you can add the 16K, 32K or 64K Memopaks, which are priced at £29 90, £49 95 and respectively

To extend your micro system still further, you could alwaysadd one of the other three Memopaks which provide a High Resolution Graphics package, a Centronics Printer interface, and an RS 222 Printer Interface. These are all priced at £39 90

You could also ask Memotech about their ZXB1 keyboard if you're going to phone them of 0993 2977 Written enquiries can be directed to Station Lane. Witney Oxon OX8 6BX



RAM Packs - Cambridge Mitroelectronics A

Amongst the range of products Cambridge Microelectron as have on offer, there is the 64K RAM extension for the ZX81 Complete with an LED and cator for power the unit comes with a fink option to disable RAM in the 0-16K area of the ZX81's memory and is designed to accept an EPROM as an alternative. The proceof this unit is £69.95 + VAT and has been designated the Dream-81.

Another product might of interest and that is the ROM 81, which is a memory expansion unit for the ZX81. This enables the user to read useful routines and commonly used information, stored in UV erasable PROM. The unit is supplied without EPROMs as these are normally programmed and provided by the user. The price of this device is £17.20.

For more information on these and other products in their range, get in touch with Cambridge Microelectronics Ltd, 1 Milton Road, Cambridge CB4 1UY or phone 0223 314814

Organic Micro - BASICare Microsystems ▼

The Organic Micro is a series of stackable add on devices for your ZX81 or ZX Spectrum

Each module plugs firmly into each other giving you a modular range of options. The foundation of this system is the Persona unit which is the direct interface to the computer. Thereafter, all the add-ons simply plug into and stacked on top of this unit. These options may include memory expansions. Centron contreface, input Output, access and control of the outside world EPROM ROM at thes non visible storage of program or enhanced graphics facilities. There is even the Sonus a new

package which composes a versatile sound synthesiser

The range of extensions to your computer's use will increase as BASiCare bring out more modules Projects in the planning stage at the moment include a floppy disc interface joystick control er and an EPROM programmer

The onginal Persona unit you will need is priced at £39,50, and the other peripheral devices are priced between £22,20 and £41,75. For further details of these packages contact BAS(Care Microsystem Ltd. 12 Rickett Street, London SW6,18U or 'phone 01-385,2135.

Extending the memory capacity of your Spectrum is no problem for East London Robotics. They have the SP48, which expands your 16K model to 48K, and the SP80 which takes your Spectrum to an 80K machine. The 32K expans on costs £35 for issue one machines and £23 for issue two models. Likewise for the 64K expansion, it will cost you £50 for issue one expansion and £46 for issue two models. For more information speak to East London Robotics on 01 471 3308 or write to them at Gate 11, Royal Albert Dock, London E16.

You can expand your computer's memory be it Spectrum or ZX81, with equipment from dK'tronics. They make available a 16K and 48K RAM pack for the ZX81 which are priced at £22.95 and £52.95 respectively. Upgrades for your 16K Spectrum to make it up to a 48K model will cost £35 for issue one and £30 for issue two machines. Further details are available from dK tronics, Unit 2, Shire Hill Industrial Estate, Saffron Walden, Essax CB11.3AQ Telephone enquiries can be made on 0799.26350.

For the ZX81, Computer Add-ons have a 16K RAM pack for £15.99 and a 64K model for £44.25. They also provide RAM add-ons for the Spectrum including memory upgrades taking the 16K model up to 48K. These are priced at £34.50 for the issue one Spectrum and £20.50 for the issue two machine. A 64K memory upgrade is available for the issue two Spectrum, bringing it up to 80K in all, for £44.25. For more details call 01.609.7919 or write to Computer Add-ons, 7-9 Thane Works, Thane Villas. London N7.

Add-on firm, Indescorp have produced some new hardware pieces for the Spectrum and ZX81 including some memory devices for the ZX81. There is the 16K, 32K and 64K units and these are priced at £16.95. £21.70 and £32.69 respectively. They are also providing an external expansion unit for the Spectrum making it up to 48K which is priced at £28.50. For more information on indescorp and the rest of their Sinclair range of hardware, including keyboards, joyshoks, sound generators, etc., write to them at P.° Castellana, 179, 1.º Madad 16, Spain

Cheetah Marketing Ltd have introduced a 32K RAM pack for the 16K Spectrum allowing it to be upgraded to a fully fledged 48K machine. Its injection moulded case has been specifically designed to fit the contours of the Spectrum to stop worries of the RAM pack wobbie' syndrome. The device is fully compatible with all Spectrum accessories. Priced at £39,95, you can find out more about the units if you write to Cheetah at 359. The Strand, London WC2R 0HS or liphone 01,240,7939.



add a vith a

from

osen

ysare

th the

or the

iance ined

CCLIFS

cımal

n left

ow o

ed as

de1A

Box

ed at state, shot, hone 0252 them

pen, a rface

f79 stem s add spaks ubon on cs S 232

otech rd if m on s can ane,

1984

re all

- Morex Peripherals have put together two interfaces, both priced at £39.95, in one box, with versions for the Spectrum and the ZX81. Each package includes a Centronics parallel and a bi-directional RS 232 interface. With these devices you can print the full length line allowed by the printer you attach your micro to, use the LLIST and LPRINT BASIC functions, and use a selection of baud rates. The Spectrum version uses a built in operating system allowing you to use word processing packages. For the ZX81, software will soon be available to allow word processing and graphics to be used. For more information, get in touch with Morex Peripherals Ltd, 2 Balliol Road, Caversham, Reading, Berks or 'phone 0734 478864.
- Hilderbay have produced an interface in the Centronics style for the Spectrum as well as the software to run it. Complete with one metre of cable, the package is priced at £45. Software for the Hilderbay interface is written in BASIC and machine code, and supports the use of LLIST and LPRINT, as well as including a software routine so that you can copy the screen. The software provided also includes a mini-word processor from Tasword. More details of this interface combination can be obtained from Hilderbay Ltd, 8-10 Parkway, London NW1 7AA. Telephone enquines can be made on 01-485-1059.
- A parallel Centronics interface, ZX LPRINT, is available from Euroelectronics for £30. Packaged in a solid housing, the unit plugs into the rear connector of the Spectrum. The device can cope with the Spectrum keywords, LLIST and LPRINT, but needs additional software to use the COPY command, this can be supplied on a cassette for those that require it. Further information is obtainable from Euroelectronics, Zlin House, Oakfield Street, Cheltenham, G os GL50 2UJ
- Cobra Technology have two interfaces for the ZX81 providing connection to either a Centronics printer or an RS 232 printer. The devices connect onto the back connector of the ZX81 and provide a baud rate variable under software control. Both units are priced at £26. F. VAT, and you can find out more about them from Cobra Technology Ltd, 378 Caledonian Road, Islington, London N1 1DY.

Interfaces

Centronics I/F - Kempston*

This interface allows the Spectrum to be connected to any Centronics type printer

Housed napurpose built case, with one metre of cable the interface fits onto the rear connector of the Spectrum Software provided with the package allows the recognition of the BASIC keywords LLIST and LPRINT allowing programs and text to be listed and text to be printed up to the full length of the printer attached. There is also provision for the screen to be

copied onto the printer This oftware provided is written in machine code and caters for both the 16K and 48K version.

The interface is fully compatible with Tasword I the business word processing package and with a few minor alterations you can also use Psion's Vu Calc

The Centron cs interface, complete with printer cable and supporting software, is priced at £45. For more information contact. Kempston Micro Electronics, 180A Bedford Road, Kempston, Bedford MK42 8BL You can phone them on 0234, 852997.



Spectrum/ Tandy I/F - Softest ▼

The Softest interface a lows the ZX Spectrum and ZX81 to be connected to the Tandy semi-intelligent printer, the CGP 115

The interface allows printing and plotting on the Tandy machine, as well as a wide range ___

facility of overprinting in different colours. The printer itself has four penicolours, red, green, blue and black, and the printing speed is 52mm, sec on the hor zontal and 73mm, sec on the vertica.

The interface hardware comes complete with software written in machine code to control the movement of the pens. With this package you can print out text,

plans, drawings, program listings pobliayouts, charts and oversize lettering

Priced at £35, you can find out more information from Softest, 10 Richmond Lane, Romsey Hants SO5 8LA. There is also available additional software allowing you to copy the Spectrum screen onto the Tandy printer priced at £5.

Centronics I/F - Advanced Digital Systems

Advanced Digital Systems have introduced a Centronics interface for both the ZX81 and the ZX Spectrum

Comprete with one yard of cable and a Centronics plug, the package comes complete with software which recognizes LLST and LPR NT enabling direct printouts from BASIC. This unit is guaranteed for 12 months.

As well as being compatible for both the ZX81 and Spectrum, with add tional software and an inexpensive adaptor card you can also use the interface with the Jupiter Ace.

The complete package is available from Advanced Digital Systems for £34.50, and for more information you could write to them at 9 Bonchurch Road, Portsmouth, Hants PO4.8RY Telephone enquiries can be made on 0705.823825.



NG DECEMBER 1983/JANUARY 1984

tten in or both

fully d the essing minor o use

rface, ne and iced at nation Micro Road, 2 88 L 0234

have

rface

e ZX d of , the With 1.205 bl ng SIC r 12

efor rum, d an you with

e 15 igrtal nore e to oad. BRY nade

For physically disabled people, there is a special series of keyboards. There is the Desk-top Scanning device, the Briefcase Scanning model and the Expanded Keyboard model, Each has been designed to help people with certain afflictions. The price of the units is very much dependent on the mput devices used with the keyboards, so it would be best if you made further enquiries to Possom Controls Ltd, Middlegreen Road, Langley Berks SL3 6DF or 'phone 0753 79235.

 A new concept in keyboard overlays has been introduced. by Tactile aimed at early education programmers. The Tactile keyframe fits over the Spectrum, and a series of keyboard overlays can be attached. The overlays come in all sorts of shapes and colours, and the company produce campatible software which utilise the overlays. For further information contact Tactile, Wraith, 32 Elmfield, Kingswood, Bristol BS15 2SS or 'phone 0272 678431

 Consisting of a brack ABS resin case, the Push Button keyboard locates over the ZX81 keyboard providing a much improved keyboard. Once attached, you have a keyboard overlay with raised keys which provide a positive feel to them. when pressed Priced at £9.95, you can find out more about this nexpensive keyboard alternative from Filestixty Ltd, 25 Chippenham Mews, London W9 2AN or by telephoning 01-289 3059

 Microtext have produced a keyboard for the Spectrum. which is priced at £53.45. The keycaps are clearly marked, some in five colours, thus denoting their function. The key board also incorporates a cursor control pad with a 'fire' button and four sensibly placed direction buttons. For more information contact Microtext UK Ltd, Highland House, 18-24 John Street, Luton, Beds LU1 2uE or 'phone 0582 418894.

The FD42 keyboard has been designed not only to contain the ZX81 or Spectrum, but also Fuller's own range of motherboard power supply, RAM cards, as well as room for two other boards. The case itself houses a 42 keyswitch board, the extra keys can be assigned to a special function. The price of the unit is £29 95 and you can find out more from Fulier Micro Systems, The ZX Computer Centre, Dale Street, Liverpool 2. Telephone enquines can be made on 051 236 6109.



Keyboards

Kevboard Case dK'tronics

A keyboard is now available from dK'tron cs which can be used with both the ZX81 and the ZX Spectrum

The cased keyboard, mesur ng 9 inches by 15 inches by 2; inches, includes 52 keys, 12 of which are used for the numeric keypad. The actual case is

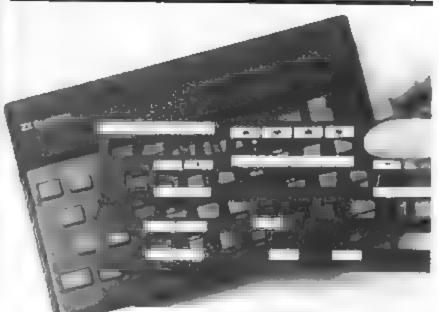
coloured black while the keys are grey and red

To install the computer nside the case, the micro must be taken from its original cas-

ing - however, the keyboard case has been customised for easy fitting. There is also room for the power supply and add tional RAM packs should you be using the ZX81

All the connections usually found at the back of your computer are faithfully reproduced at the back of the keyboard

case for easy access. Priced at £45 inclusive, you can find more details on the keyboard case from dK'tronics, Unit 2 Shire Hill Industrial Estate, Saffron Waiden, Essex CB11 3AX You can always phone them on 0799 26350



Custom Key Panel Kits Softeach

You can now customize your keyboard to suit ail the different pieces of software you

For example, in some games the keys you need to press to move right and left are often the '8' and '5' keys respective y however, as you all know, other games can be completely different and require a

staggering number of keys to

properly play the game. With this kit, you can now place a card over the keys and using sticky labels create uncomplicated guides for your different software packages

Softeach provide 10 overays and two sheets of sticky labels, one already printed with words like left', 'right', 'asers' 'fire', keypanel for ', etc, and the other left blank for you to make up your own abels

The Custom Key Panel Kits are priced at £3.95 a pack, You can get more information from Softeach Ltd, 25 College Road, Reading, Berks RG6 1QE

Tactile Keyboard Steatite Insulations

This keyboard, for the ZX81, incorporates full-travel keys and provides the professional mechanism for proper touch typing

The case has a low profile and the keys are angled to ease

typing. A full complement of egends is supplied for the ZX81 with clear plastic inserts so that the legends remain intact over a long life

Ful instructions are provided as to how the unit is fit ted. You can obtain this keyboard for £30.95 from Steatste Insulations Ltd, Hagley House, Hagley Road, Birmingham B16 8QW Telephone enquiries can be made on 021 454 6961

- Big Ears and the Chatterbox are two sound devices developed for the ZX Spectrum. Using the Big Ears package, priced at £49, you can teach your micro to recognize individual words. The Chatterbox system is a nice solid box with speaker built in allowing you to build up phonemes to create words. This unit is priced at £49. For more information contact William Stuart Systems, 44 Bedford Gardens, London W8 7EH.
- Trichord is a plug-in music and sounds peripheral for the Spectrum and ZX81. Priced at £24.95 and £26.95 for the ZX81 and Spectrum versions respectively, the unit incorporates a PROM which holds many music and sound effects. Further details are available from Petron Electronics, Courtlands Road, Newton Abbot, Devon TQ12 2JA or by telephoning 0626 62836
- There are two units available from Timedata called the ZXM Sound Box and the ZXS Speech Synthesiser, priced at £29.95 and £32.50 respectively. These units are compatible with both the ZX81 and ZX Spectrum. For further information get in touch with Timedata Ltd, 16 Hemmeils, Laindon, Basildon, Essex SS15.6ED Telephone enquires can be made on 0268 418121.
- From Micro Power comes the Spectrum Add-on, priced at £19.96. The board, once connected, provides three channel sound affects, includes a 2 Watt amplifier and loudspeaker to amplify the effects, and has room on-board for two joysticks. These joysticks can be purchased for £7.45 each. For more details contact Micro Power Ltd, 8/8A Regent Street, Chapel Allerton, Leeds LS7.4PE or telephone 0532 683186.
- Fuller Micro offer three units which offer various voice synthesis and sound effects. These are the Orator priced at £39.95, the Fuller Box, priced at £29.95, and the Master Unit, incorporating the features of the other two and priced at £54.95. More details are available from Fuller Micro Systems, The ZX Computer Centre, Dale Street, Liverpool 2.
- The Sweet Talker, available for £34.95, is designed to provide apeech synthesis for the ZX81 and ZX Spectrum. The package comes complete with demonstration cassette and instructions on how to use the allophone system. More details can be obtained from Cheetah Marketing Ltd, 359 The Strand, London WCZR OHS or by 'phone on 01 240 7939.
- With automatic key voicing, Microdrive compatibility comes the MicroSpeech unit at a cost of £29 95. Designed for the Spectrum, the device allows you to build up words using individual sounds. Find out more from Currah Computer Components Ltd, Graythorp Industrial Estate, Hartlepool, Cleveland.



Speech

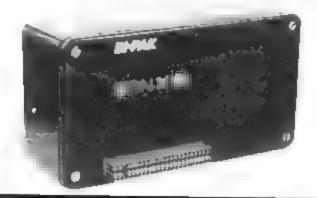
ZONX-81 – Bî-Pak Semiconductors v

The ZONX 81 is compatible with all Sinclair computers, although for the Spectrum an adaptor is required, this can be bought separately for £6.80 if you are upgrading from '81 to Spectrum

The unit offers a wide range of sound effects, such as pianos, bells he icopters lasers

explosions, etc. The sound chis used has been designed so that the patches and volumes of the three channels and overall attack delay envelope can be controlled by BASIC statements.

The ZX81 version of the device is priced at £25.95 and the Spectrum model comes complete with adaptor at £32.75. Details of these units are available from Bi-Pack Semiconductors PO Box 6, Ware, Herts or in telephoning on 0920 3442.



S-Pack - DCP Microdevelopments *

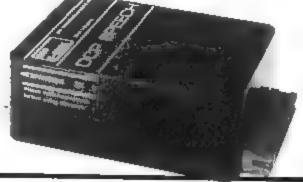
This is an upgrade of the Digitalker and old speech unit for the ZX81. Now designed for the Spectrum, you can get hold of the S Pack for £49.95.

The unit comes supplies with a vocabulary of 71 words, phrases numbers and letters. These can be called from programs using

simple BASIC statements.

Should you get bored or feet confined with this collection of speeches, you can always purchase one of DCP's other three Word Packs, priced at £14.95, which come as ROMs.

Further details on the S Pad are available from DCP M crodevelopments Ltd, I Station C ose, Lingwood Norwich NR13 4AX. And if you phone them on 0603 712482, your get like to ask them about the interspec unit which provides at expansion bus for the Spectrum.



Speech Synthesiser – Spirit Instruments∢

A speech synthesiser for the ZX Spectrum is available from Spirit Instruments.

Measuring only 3 ½ by 5% by 1 inches, the unit provides speech by building up individual sounds until you make complete words and sentences. The unit plugs into the rear connector of the

Spectrum and provides sound through a speaker in the front of the unit. Although adequate for most applications, should you want the sound any louder you can always take an output from the unit to an external audio help.

With the unit, you get a guide as to how to form most sounds, but of course it's up to you to find the best ones!

For more information, contact Spirit Instruments, Heybridge, Maldon, Essex 1..... Brief

Voltmace are providing a new roystick system to the market. Their joysticks for the Spectrum or ZX81 will be available at £5.95 each. There is also a programmable interface which with the complementary software means you can program the joysticks to any keys of the micro. The programmable interface is priced at £24, although if you buy interface and joysticks together you will only pay £27.50. More details are available from Voltmace Ltd., Park Drive. Baldock, Herts SG7.6EW. Telephone enquiries can be made on 0462.894410.

Available from Addpac Electronics is the Addpac JS11 joystick and interface for the Spectrum. Complete with demo program, this package is priced at £18.99 all inclusive. For more information get in touch with Addpac Electronics, 22 Watling Street East, Towcester, Northants NN12 7AF.

The Pickard Controller is a device a lowing you to connect any Atan-type joystick to the 2X81 or Spectrum. The unit also allows you to specify which keys the joystick is to emulate. The price of the Pickard Controller is £20.45, and if you want to buy joysticks from them, you'll have to pay £7.50 each. For further details contact Success Services, 154 High Street, Bloxwich, Walsa I, West Midlands WS13.3JT.

Electrotech have produced a boxed joystick with three large push button controls which smacks of the 'reel' arcade machines. Proced at £43-70, the unit contains a 2K RAM pobland plugs directly in the rear of the Spectrum. If you want to find out more about this device contact Electrotech at 2 Heath Close, Winston Hill, Luton, Beds or telephone them on 0582-429809.

The Protek Interface unit provides the Spectrum with access to any Atari-type joystick. Priced at £14.95, the unit simply plugs into the back of the computer. For further details get in touch with Protek Computing Ltd, Clydeside Bank Building, High Street South Queensferry, Edinburgh EH30 or liphone 031-331 4400.

The Analogue Input device from Midwich comes as a kit to be made up and is priced at £22.95. Provision is made for two joysticks and the unit simply plugs into the back of the Spectrum. Midwich also make available joysticks at a price of £7.99. Further information is obtainable from Midwich Computer Company Ltd, Rickinghall House, Rickinghall, Suffolk IP22.1HH



Joysticks

Competition Pro Joystick – Kempston v

The Kempston Competition Pro Joystick is certainly a solid looking joystick constructed from steel and strong hylon

With a self-centering stick, the joystick permits movement in eight directions and has two large fire buttons (for left and right handed operation) Although compatible with many games on the market. Kempston offer three soft ware packages from Kempsoft which allow even more games to be played with their joystick.

Priced at £25 for interface and joystick you can find out more about these dysticks from Kempston Micro Electronics 180A Bedford Road, Kempston, Bedford MK42 88t or you can telephone them on 0234 852997



Programmable Joystick Interface – AGF Hardware

Upgrading the Interface Module Is comes the Programmable Joystick interface at £32.95 which is claimed to be compatible with all software.

Plugging into the back of either the ZX81 or Spectrum, using quick clip on connections you can define which of the 40 Spectrum keys you would like simulated by the joystick. Also included with the package is a

quick reference card which outlines the connections you! need to make for ten of the most popular games

As with the interface II model this interface is compatible with Ataritype joysticks, two sockets are available. With every order, you will also receive a demonstration program called Video Graffit which shows you how to implement the joysticks right away.

For further details get in touch with AGF Hardware 26 Van Gogh Piace, Bognor Regis, West Sussex PO22 98 Yor phone 0243

Triga Command - Datal Electronics ◀

The Triga Command looks as though it might be the shape of things to come

From the States, the real home of the arcade game comes this rugged joystick, with a firing button in just the right place to kill all those all ens. The internal

moving parts are made of solid nylon rather than plastic so that it should be stronger

The joystick comes complete with an interface unit so that it can be plugged into the Spectrum Triga Command is priced at £19.95 for interface and bystick complete.

For more information talk to the people from Datel Electronics on 0782-273815 or write to 27 Hope Street Hanley, Stoke on

chip

that

of the

veral!

n be

ents.

evice the

mable

ctors,

or by

r feel

rays

other

d at

Pack DCP

1, 2

ood,

you

, you

their

es an

rum

bruc

e for

you

you

irom

hi-fi uide

nds,

find

tact

dge,

- Dean Electronics have introduced a new style printer to the market based on the American version of the Sincla's printer Designated the Alphacom 32 and priced at £99.95, the new printer can be utilised with both the Spectrum and ZX81. Using 4½ inch. wide paper, the printer prints at 32 characters per second. The unit incorporates a built-in interface which accepts the BASIC keywords such as COPY, LLIST and LPRINT, and will also print user defined graphics. For further details get in touch with Dean Electron cs Ltd, Glendale Park, Fernbank Road, Ascot, Berkshire or telephone 0344 885661
- A tape loader from Elinca Products should help you t OAD and SAVE programs when using the ZX81. The ZX Tapeloader filters. and stabilises the signals in both directions, providing a signal perfectly matched for the computer. The unit also incorporates an audio output indicator and signal amplifier to enable you to correct the input signal. Further details on the ZX Tapeloader are obtainable from Elinca Products Ltd, Lyon Works, Capel Street, Sheffield S6 2NL or by 'phoning 0742 339774
- Suitable for the 16K or 48K Spectrum comes the Prism VTX 5000, a modern which puts you in touch with Micronet 800, the huge database of information, software and other users. Using this device you can choose from hundreds of free games educational and business packages, access the whole range of Prestel information and keep in touch via electronic mail with any other Micronet 800 or Prestel user. The Prism VTX 5000 modern is priced at £99.95 and is available from Micronet 800. Scriptor Court, 155 Farringdon Road, London EC1R 3AD or you can phone them or 01-278 3143
- If you're expenencing loading problems on your ZX81 you may. like to consider to Z-Dubber, a loading aid from the States. The device interfaces between the cassette recorder and the micro. and the sound is boosted before it reaches the ZX81. You can also connect the Z Dubber between two recorders to get good backup program storage. The unit is priced at \$29.95 and is available. from Bytesize Computer Products, PO Box 21123, Seattle, WA
- The ZX99 Automatic Tape Controller, priced at £49.95 allows software control of up to four tape recorders, automatic tape copying and tape block skip without destroying the contents of RAM The device also provides an RS 232 interface for the ZX81 For more details, contact Data-assette, 44 Shroton Street, London NW1 or telephone 01-258 0409

Adding

Executive Case - Treetop Designs

Specifically designed for the Spectrum, this ABS plastic case combines the features of an executive case allowing you to carry your equipment around with you, and also as a console on which to work on

The console features a raised and inclined support for the Spectrum and a secure housing is provided for the power pack giving access to the air for circulation. There is also room for

a printer, cassette recorders and interna wing An off on switch and OAD SAVE switch are also provided

Six cassettes and spare printer paper may also be stored in the unit, and the lid, as well as room for storing leads, comprises t soft foam cushion to keep the equipment secure in transit

The whole package is pricedal £47 45 and is available from Treetop Designs, 61 Widmord Road, Bromley, Kent They are a so working on a new design of incorporate storage of the Microdrives, and they will be abl to convert the old version case to be able to carry the Microdrives

RAMLOK Adapt Electronics

of you suffer from an unreliable RAM pack connection on your ZX81 you may like to consider a RAMLOK kt

Consisting of a high quality, gold plated male connector which replaces the computer connector, and a mechanica clamping device the RAM pack is clamped to the computer securery. No drilling, soldering or special tools are required to carry out this modification. Suitable

for connect on to most popular RAM packs, the RAMLOK KILL priced at £7 50

There are also a series of RAMLOK if adaptors which stop the 'RAM pack wobbit syndrome and provide a mproved quality edge connector for the computer This kit if available for the Spectrum and the ZX81 and is priced between £2 50 and £6, depending on the machine and what modification you wish to make

For more details speak to the people at Adapt Electronics 2 Starling Close, Buckhurst Hil, Essex IG95TN or phone themen

01-504 2840



desk console constructed from heavy gauge black ABS plastr with a detachable base cover and non-sup feet On board the console, theres

room for the Spectrum, power suppry, Sinclair Printer RS 22 interface, joystick control had Microdrives cassette recorde: cassettes and pencils, etc. Then is also a built in switch which means that you don't have to alter the leads when you as LOADing and SAVE ng.

The price of the device s £42.18 and is available from: Traffic Technology Ltd, PO Box 2, Warminster, W. tshire BAIL

7QX



Computer Desk PH Scientific Products A

PH Scientific Products have available a computer desk made from ABS plastic for both the ZX Spectrum and ZX81

With recesses for the computer and printer, there is also support for a television to rest on top of the unit. The power supply and untity wiring can be safely hidden from view

The price of the Spectrum Products Sc ent f c

Monicron - MacOuillan Electronics

Designed to assist users by providing a convenient consistent means of loading and saving programs on tape the Monicron is priced at £15 95

The Spectrum model has a built-in amp fer while both ZX81 and Spectrum mode:s leature a power on off switch All functions are performed without the need to disconnect or awap plugs. The internal high qualty components are contained in a purpose built, injection moulded case to form a small compact unit

Also available is an 'enhanced' Spectrum mode: containing a 2 Watt amplifier and external socket for connecting a larger audio type speaker. The price for the enhanced' model is £16.75.

For further information contact MacQuillan Electronics, 72 Mere Road, Wigston Magna, Leicester LE8 1RL

with full dynamic control of every pixel in BASIC

A 2K EPROM contains the Hires BASIC monitor offering a range of powerful commands such as PAGE PLOT and SCROLL, which can be used for defining your own characters, drawing lines, plotting complex case character set for word processing

The pack is compatible with the Sinclair Printer, and comes complete with a comprehensive handbook illustrating how you can get the best from the device

The unit is priced at £38.95, although there is an opportunity for schools to arrange for a discount. For more details get in touch with Digital Integration, 22 Ash Church Road Ash. A dershot, Hants GJ12 6LX

version is £16 and £1 less for the ZX81 computer desk. For further details get in touch with PH Southfield Welwyn Garden City, Herts or phone 07073 20241

High Resolution Graphics Pack – Digital integration **A**

This accessory for the ZX81 gives

functions, and a complete lower

If you're having problems with your mains voltage when you're using your Spectrum and ZX81, the Battpack may be the answer. The device comprises a rechargable 9V Ni-Cad battery. pack and transient suppressor, housed in a similar casing to the Sinciair Power Pack. The Battpack ensures that the voltage into

eliminating program crash through voltage problems. Priced at

the Spectrum and ZXB1. The Wobble Stopper comes in three

£13.95, you can find out more from Adaptors and Eliminators Ltd,

Kelwood Computer cases have been busy providing stands for

models, small, titted and large, and can be used with the ZX81 to

pack to the micro. These units are priced from £5.25 to £6.75. For

the ZX81 and Spectrum, there is the Power Base, which holds the

stop the 'RAM pack wobble' syndrome as they clamp the RAM.

micro firmly in place while you use it. The price of these devices

more information, you could contact Kelwood Computer Cases.

Kelwood Heating Ltd. Downs Row, Moorgate, Rotherham S60

Hypnotech. The device comprises an 8 Watt amplifier with a 10 Watt woofer and tweeter in a small speaker unit. The unit is mains operated and plugs into the MIC socket of the Spectrum, Priced

at £23 95, you can find out more about this device from

Hypnotech, 3 West Vale, Neston, South Wirrel L64 9SE

Lasily adapted for a variety of uses comes the BEEP Amp from

are £13 for the ZX81 and £13 50 for the Spectrum version. For

your ZX81 and Spectrum never drops below 9V, thereby

14 Thames Street, Louth, Lincs,

2HD, or telephone 0709 63242

a full 256 by 192 pixel display

2X COMPUTING DECEMBER 1983/JANUARY 1984

BA12

Y 1984

ers and

switch.

re also

printer

n the

s room

rises a

en the (ť.

reed at

from

idmore

ev are

sign to

f the

be able case to

drives

oopu ar

K kit s

ries of

ch stop

obble

de an

mector

kt s

m and

etween

on the

cations

to the ics, 20 st Hil.

no mar

re is a

from plastic.

er and

here is

power

S 232

l. two

order,

There

which

ave to

ou are

Ace is

O Box

from

- If you want to tidy up the wiring you accumulate around the ZX81 or Spectrum, there is a large black tray and stand which you can get from Computerlock for £31.50. With room to stand a television on top of the stand, the computer sits comfortably with air the trailing wires tucked away inside the unit. Further information is obtainable from Computerlock. 2 Wychperry Road, Haywoods Heath, West Sussex RH16.1HJ. Telephone enquiries can be made on 0444.451986.
- In the cheaper end of the console market comes a cardboard unit from Print 'n Plotter Products Priced at £8.25, this cardboard stand provides room for a Spectrum, power supply and printer. The package has to be made up, but this is quite simple with the instructions provided. Although not room for peripherals, modifications can easily be made due to the texture of the vinyl-covered box. For more details contact Print 'n' Plotter Products 48 Borough High Street, London SE1.9SE
- The Micro Myte 60 acoustic modem, priced at £48, provides a low cost means of communicating information between compatible micros at ising the telephone network. The device can be used with the 48K Spectrum and the ZX81, and the menudriven software provides transmission of either complete programs, defined areas of memory or complete screen contents. For more information contact Micro Myte Communications Ltd, Polo House, 27 Prince Street, Bristo, 1 or telephone 0272, 299373.
- He Stak is an add-on which has been designed to stick on the base of the ZX81 or Spectrum to the keyboard giving the user better access to the keyboard. Comprising two injection moulded ABS ramps with built in rubber feet, they are available for £3.95. More information is obtainable from Warp Factor Eight, 6 Pelham Road, Braughing, Ware, Herts SG11 2QU or by 'phoning 0920 821841.
- The Stabiliser Pad has been designed to keep your ZX81 from flying across the desk as you try and key your programs in Made from a strong rubbery substance, the pad holds ZX81 and RAM pack securely. You can get one of these units from Stream Computers, PO Box 113, Ajax, Ontario L1S 3C5. Canada, for £4.50.
- Aimed at the business user eager to impress is a custom case for the Spectrum and all its associated peripherals. Looking very much like an executive case, all the equipment is housed in small compartments of shock absorbent foam. Priced at £34.95, you can get further details from Computex Cases. Stanhope Road, Camberley, Surrey GU15.3PS.
- From RD Laboratories you can get a very sophisticated drawing instrument for the Spectrum. Using the cassette full of software provided with the package, you can get the Digita. Tracer to plot individual points, draw lines, after the background and foreground colours, shading, printing and editing text on the screen. There is also a co-ordinates program and one that allows you to draw at a very fast speed. Priced at £49.95, further information can be obtained from RD Laboratories, Unit 20, Court Road industria. Estate, Cwm Barn, Gwent NP44.3AS.
- A Spectrum workstation is available from Peter Furiong Products made from durable ABS plastic and priced at £16. There is a slot for the Spectrum and the associated wires are hidden away; space on top of the unit is provided for the television. LOAD SAVE switches, speaker units and an affoy base are provided for a small extra charge. More details can be obtained from Peter Furlong Products, Unit F, South Coast Road Industria Estate, Peacehaven, East Sussex BN9 8NA.

BEEP Booster – Compusound

The Telesound BEEP Booster's an upgrade of the Telesound 84 Jn.t, the new unit can be fitted not only to the ssue two Spectrum but also to the issue three Spectrum.

The BEEP Booster allows you to amplify the sound from your Spectrum through the television speaker so that you can really make the most of the more

noisy' programs available on a market. Measuring only 2cm to 1.2cm by 1cm it sic aimed to a the smallest modulator in the world.

The BEEP Booster is connected inside the Spectrul via miniature piated c. ps who push onto the connection points For more information on the BEEP Booster phone 0527 2140 or write to Compusound at I Langley Close, Redd (ch.) Worcester B98 0ET

Victagraph – Victa Ceramics

f you find you need some help with the PLOT CIRCLE and DRAW commands on your Spectrum you may find some so ace in the package from Victa Ceramics.

Comprising a white plastic base sheet a clear plastic offset co-ordinate window a clear plastic callbrated window and a clear plastic window mask with a plot sight in each corner, the

Victagraph also includes a tel design, comprehens a instructions and a number a sticky patches

Using the various window masks over a test design to mask will hide all the unwants co-ordinates eaving you withit required figures.

The price of the Victagraph package is £7.50 but for moninformation contact Victorians 6A Bow Street Rugeley, Staffordshire of telephone 08894 2426



Microcase - Micro Aids

The Microcase is just one of the products available from Micro Aids

The Microcase, designed for both the Spectrum and ZX81, is an executive style case with a fully detachable lid. The inside is fired with foam to secure the equipment, and can contain the computer, cassette recorder and cassettes, power pack, printer and leads. The price of the

Microcase is £32 95

There is also a workstation available, which has space for a Spectrum cassette Microdrive and monitor. This unit is priced at £22.95.

You could also ask them about their Spectrum Planning Aids, Dust Covers and various other devices.

For more information contact: Micro Aids, Distribution Centra, Beech House, Hob Hey Lant, Culcheth Warrington, Cheshie WA3 4LN Telephone enquires can be made on 092 576 2613

on the om by to be n the

r is ctrum wh ch oints r the 21439 at 32 itch,

ndow the anted

graph more Victa treet e or

a test sive. er of

th the

NEW

ation for a dove ed at

about Aids, other

ntact entre Lane shire urries 13

1984



Programming and graphics by Micromega-

Already available Simple adding & subtracting 4-Syrs EP/95 EX Spectrum 16k/46k

Parisonne ME 440

Letter learning

XX Spectrum 16k/46k

4-Syrs A7.98

Mumber recognition 4-Sym A7.85 IX Spectrum 16k/40k

Maths Practice

6yrs+ 47,95 EX Spectrum 16k/48k

SUM SCRUNCHER

4 81

Introduction to the alphabet & word recog-nition 4-Syrs £7.98 £X Spectrum 16k/46k §





Spelling game Syrs+ £7.05 EX Spectrum 16k/48

colour graphics

When we launched our

were delighted. At last

from Britain's top

programs were available

let you use your home

computer to help your

early learning software you

educational publisher that

children learn important basic skills. Now we've

added eight exciting new

games that cover an even

the fun with the Robot Runner, Sum Scruncher, Micro Chimp and lots more

wider range. Early-learning

is easy as children join in



A game to develop problem-solving skills 4-Syrs 49.95 BEC 1



Practice in number skills 4-8yrs &9.95 BBC B



Relp with adding &

subtracting 5-7 yrs



Help with adding &



education and the The Marker Me 2 at TWH 11 5 DE OFF FIT BOTT

regard pour las Rornt Mill Harlow Longman Group Ltd Burnt Mill Harlow

Longman Group Ltd Burnt Mill Harlow

Essex CM20 2JE

Time bomb

Can you save the city from the hidden time bomb - a great program for your 16K ZX81 from Oliver Fritsch of West Germany.

Somewhere in the city ait me bomb has been hidden which is due to detonate in a very short time. It's up to you to find and defuse the bomb before it goes off and devastates the city.

When you RUN this program, you will first be greeted with an aerial view of the part of the city your intelligence people tell you the bomb is cached in in this area of the city you will see a number of buildings the time bomb might be hidden in You move your character an asterisk using the direction keyson the ZX81 the 5 6 17 and 8 keys

When you touch one of the houses with your character, you will be provided with another this time of the aeria view house you are preparing to sear ch. The bomb is represented by an inverse BB' character and you should head for it, again us ing the direction keys If the house you have entered does not contain the bomb, you will have to exit the house as quickly as you can via the inverse. A character and move onto another house to continue your search

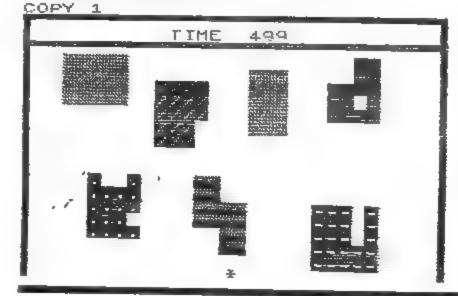
Time and motion

Once you have found the time bomb, you should move your character onto that square. Be careful not to bump into any of the walsof the house or tiw be taken to mean that you have bumped your head. This rendering yourse funconscious, and you will lose valuable time points. When you touch the bomb, you will be given the time streen which shows your character standing by the time bomb.

The fuse of the bomb shown as an inverse Z moves inside the bomb from top to bottom. All you have to do is to shoot at the fuse using the B' key to render it harm ass. Don't worry. I you don't manage to defuse the bomb with your first shot as you'll have three goes. Should you want to give yourself a better chance of hitting the fuse you could always change the number. 3 in line 9126.

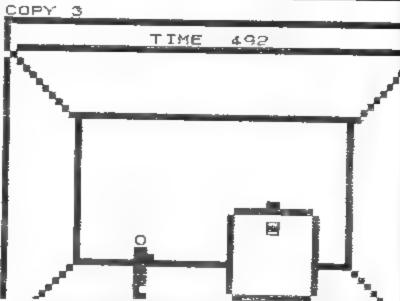
Once you have defused the bomb you will be presented with your own score and the current highest score. But don't hang around in remember that time is of the essence.

Your first view of the city from above. Your guest is to find out which building contains the bomb.





Once inside the building you must search for the time bomb exit is denoted by an inverse. A character



You have found the bomb! Now all you have to do is to shoot the moving fuse, which is denoted by the inverse Z character

50 FF 100 RE 105 LE	T HIGHSCORE = 0 PST EM DEFINITION ET P=1 ET BOMBE = 0	IN	14E	
	T Ys="			

120	LET	Y\$="
130	LET	U\$="
14005005005005005005005005005005005005005	LET LETT LETT LETT LETT LETT LETT LETT	0=0 U=5 UU=10 R=4 RR=3 UU=12 UU=12 OU=12 OU=12 KK=14 UU=16 UU=16 U

```
220 LET
    225
                 LET
                                   III=52
                               RA-0
    230
                LET
     250 LET
                                 长事二"
     258
                                 NM=G
                1.57
  1005 LET
                                 MK =Ø
  1010 CLS
 1015
                 SLOW
  1018 PRINT TAB 3, "###############
  *****
  1020 PRINT TAB 3, "#**#
                                                                                                  FIND
                                                                                                                           TH
 E BOMB ****"
1025 PRINT TAB 3, "***********
 ****
 1250 PRINT , , "WHICH LEVEL?"; TAB
 1270 PRINT AT 7,4,"图 BEGINNER",A
T 9,4,"目 AMRTEUR",AT 11,4;"图 EXP
ERF"
 1280 PRINT AT 18,4,"(PRE55 KEY)"
1380 PRINT AT 21,4,"C 1983 BY O
LIVER FRITSCH"
 1350 IF
                             INKEYS="1" THEN GOTO 200
 1355 IF INKEY$="2" THEN GOTO
                                                                                                                      202
 1360 IF INKEYS="3" THEN GOTO 204
 1370 IF INKEY$="" THEN GOTO 1350
2000 LET ZEIT=500
2010 GOTO 5000
2020 LET ZEIT=400
 2030
                GOTO 5000
 2040 LET ZEIT 300
2050 GOTO 5000
 5000 REM DRAW ROOM
 5002
 5005
 90KE 15418,0
9020 PRINT RT R
      23,0.U$
23,0.U$
                                       AT 0,0.Y$, AT 2,0:Y$; A
 5060 FOR I=1 TO 22
5070 PRINT AT I,0." ".AT I,31,"
5090 NEXT I
5095 PRINT AT 0,0," AT 0,31,"
',AT 23,0:" AT 23,31," "
5096 PRINT AT 2,0," AT 2,31,"
 5100 PRINT AT 1,11, "TIME. "
5120 IF RA-2 THEN GOTO 8120
5121 IF RA=1 THEN GOTO 7120
                                                                                                        ";ZEIT
$121 IF RA=1 THEN GOTO 7120

5000 REH TOUNPLAN

5100 PRINT AT C,CC,"""""", AT C+

1.CC. ", AT C+2,CC,"""", AT U+1

LU,"", AT U+2,UU,"", AT U+1

LU,"", AT U+4,UU,"", AT R+1,

RR,"", AT R+2,RR,"", AT R+3,

RR ", AT R+4,RR,"", AT U+1

UJ ", AT U+2,UU,"", AT U+1

UJ ", AT U+2,UU," ", AT U+1

UJ ", AT U+2,UU," ", AT U+1

5140 PRINT AT O,DO,", AT U+1

13,BO, AT H+2,CU," ", AT O+1

,OO,", AT O+2,OO,", AT O+1

,NA ', AT K+2,KK," AT K+1

,NA ', AT K+2,KK," AT K+1

,NA ', AT K+2,KK," AT K+1

,NA ', AT K+2,KK," ", AT K+1

,NA ', AT K+2,KK," ", AT K+1

,NA ', AT K+2,KK," ", AT K+1

,NA ', AT K+2,KK," ", AT J+1

JJ, AT J+2,JJ," AT J+1

JJ, AT J+2,JJ," AT J+1

JJ, AT J+2,JJ," AT J+1

JJ, AT J+2,JJ," AT J+1

JJ, AT J+3,JJ," AT J+4,JJ," ", AT J+1

JJ, AT J+3,JJ," AT J+4,JJ," ", AT J+1

JJ, AT J+3,JJ," AT J+4,JJ," ", AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J+2,JJ," AT J+1

JJ+3,JJ," AT J
 5000 REH TOUNPLAN
 6200 SLOW
 5300 REM HIDE BOMB
                                                 THEN LET X=INT
 5310 IF
                          NM=D
                                                                                                                 ERND
 #30) +1
 6315 IF NM=0 THEN LET Y=INT
                                                                                                                   (RND
  *18) +4.
```

```
6330 PRINT AT Y.X,
6340 LET P=PEEK (PEEK 16390+256*
PEEK 16399)
             P-CODE " " OR P-CODE "*"
6350
         IF
  OR P=CODE
5400
         REM HOVING
6420
         LET
                MU=15
         LET MO=20
6425
        LET MD=20

LET A$=INKEY$

PRINT AT MO, MU, " ";

LET MU=MU+(A$="8")-(A$="5")

LET MO=MO+(A$="6")-(A$="?")

PRINT AT MO, MU,

LET Q=PEEK (PEEK 16398+256*
6427
6426
6430
6440
6450
6455
PEEK
         IF 0=P THEN LET BOMBE=1
IF 0<>0 THEN GOTO 7000
PRINT AT HO.HU, "*"
5456
6450
6465
         LET ZEIT-ZEIT-1
PRINT AT 1,17; ZEIT
IF ZEIT-000 THEN GOTO 9500
6495
6497
6498
6500
         GOTO 6427
         REH DRAW ROOMS
7000
         LET
7100
                RA-1
7102
         LET
                NH = 1
         CLS
7103
7105
         GOTO 5005
7130
         REM UALLS
         LET
                RA -8
7159 LET WE=INT (RND+13)+5
7160 LET WC=INT (RND+15)+4
7200 PRINT AT WE,0,K$
7210 PRINT AT WE,1," ",TAB WE+4,
"", TAB 29, " ""
7220 FOR I=4 TO 21
7230 PRINT AT 1,UC. "".TAB 22, "
7240 NEXT I
7300 PRINT RT UE,1." ".TAB WE+4,
" ".TAB 29," "
7310 PRINT'AT 20,3;"*".AT 4.29,"
7320 IF BOMBE=1 THEN PRINT AT Y,
X,"BB"
                   AT 20,3;"*".AT 4.29,"
X,"Ed"
7350 SLOW
7360 LET MU-3
7370 LET MO=20
7369 PRINT AT MO, HU, " "
7385 LET A$=INKEY$
7390 LET MU=MU+(A$="8"; -(A$="5")
7400 LET MO=MO+(A$="6") -(A$="7")
7410 PRINT AT MO,
7420 LET Z-PEEK (PEEK 163961256+
7420 LET Z=PEEK (PEEK 16396+256#
PEEK
         163991
              ZECODE "F" THEN GOTO 600
7430
         IF.
0
7440 IF Z=CODE "2" THEN GOTO 500
ø
7442 IF Z=CODE "" THEN GOTO 760
0
7445 PRINT AT MO, MU. "+"
7456 LET ZEIT =ZEIT 1
7455 PRINT AT 1,17. ZEIT
         PRINT AT 1,17,2811
IF ZEIT-000 THEN GOTO 9500
7460
7490 GOTO /360
7500
         STOP
7600 CLS
               RT = INT
7605
        LET
                             (RND *50) +10
7610 PRINT .. "YOU BUMP YOUR HEAD AT THE WALL."
7620 PRINT .. YOU WERE UNCONSCIOUS FOR ".RT
7625 PRINT ... TIME UNITS."
7630 LET ZEIT-ZEIT-RT
7600 PAUSE 300
7900 GOTO 7100
        REM RENDER HARMLESS
8000
8100
         CLS
         LET
8105
6110
         SOTO 5005
8111
        SLOW
8120 FOR I=0 TO 5
8130 PRINT AT 23-1,31-1;"
8135 PRINT AT I+2,1;"
```

the

he

```
PRINT RT 1+2,31-1;"
8195
       NEXT
              I
       FOR I=8 TO 29
PLOT II,I
8198
8200
8218
       PLOT
              III, I
8250
       NEXT
       FOR I=1 TO 41
PLOT II+I,7
8260
8265
8270
       PLOT
               II+I,29
8289
       NEXT
       REH DRAW BOMB
9000
       LET
            B$="
9010
9015
       LBT
             U$="
9020
9025
       PRINT
               AT
                    17,10,"
16,10;"
19,10,"
20,10;"
9027
       PRINT
                AT
9026
       PRINT
                HI
9029
       PRINT
                AT
9030
       PRINT
                AI
9040
       PRINT
                AT
                    14,17,84
15,17,U$
9845
       PRINT
                RT
9052
       PRINT
                AT
9053
                    16,17,05
17,17;05
       PRINT
                BT
8054
       PRINT
               ST
                    18,17,U$
19,17;U$
20,17;U$
9255
       PRINT
               AT
9060
       PRINT
                AT
9065
       PRINT
9068
       SLOW
       FOR I=15 TO 19
IF INKEY$="8" THEN GOSUB 91
9070
9071
00
9074
       PRINT AT I,20;"圈"
PRINT AT I,20;"圈"
NEXT I
9075
      NEXT I
LET ZEIT=ZEIT-1
PRINT AT 1,17, ZEIT
IF ZEIT=000 THEN GOTO 9500
9060
9085
9085
9087
9990
```

9110 9111 9120 9125 9126 9130 CONG	RETURN
9502 9512 9512 9513 9500 9610	FOR I=1 TO 20 PRINT AT 11.12." BANG P PRINT AT 11.12." BANG P NEXT I GOTO 9660 LET SCORE=ZEIT+5 PRINT AT 23,2,"SCORE: ",SCO
9525 9525 9550 9550 9560	IF SCORE HIGHSCORE THEN LET HSCORE = SCORE PRINT AT 23,15, "HIGHSCORE CHSCORE PAUSE SOO CLS PRINTTAB 9. "ANOTHER GAME
42	PRINT ,,TA6 10,"""Y"" OR
9700	IF INKEY\$="Y" THEN GOTO 50
9710	GOTO 9700 PRINT AT 18.11, "CHEERIO" STOP SAME BOMB" GCTC 1

ZX80 CAME

Wheeler dedier

Try playing the wheel of fortune in this game for your unexpanded ZX80 written for us by Adrian Marsh of Hampshire.

This is a very simple version of the 'wheel of fortune' type of at fairs or in the old western moves on the television Should you have more space on your computer, in terms of s mp city itself to add a line here and there

Type the program in as published and type RJN You will then be presented with a screen display showing the winning numbers. You are to start the whee of fortune

Once the whee has been turn ed, you are told whether you game you have probably seen have won or not and are told the numbers you got. You then press the 'S key to spin the wheel again

Should you have more room RAM add ons, you will find it in memory to add a line here and there, it would be quite funto allow the prayer to have a it tle flutter on the outcome of the spin of the wheel You could also start the player off with a set sum and increment and decrement this total accorthen invited to press any key ding to the success they have with the game

```
PRINT "****** WHEFLER DEALER **
 10
20
       PRINT "HERE ARE THE WINNING NUMBERS"
30
       PRINT
       PRINT "-,-,9"
40
       PR NT "2,2,2"
50
       PRINT "5,2 5"
60
       PRINT "5,5,5"
 70
       PRINT "9,5,9"
80
       PRINT "JACKPOT *9,9,9"
90
110
       PRINT
       PRINT ' PRESS A KEY TO START THE WHEEL"
120
130
       INPUT AS
140
       F A$ <"M" OR A$ > "M" THEN GOTO 150
150
       STOP
160
       CLS
170
       LET B RND(9)
180
      LET C = RND(9)
190
       LET D = RND(9)
200
      IF B >5 OR B < 5 AND C > 5 OR C < 5 AND D = 9 THEN
       GOTO 500
210
      IF B 2 AND C = 2 AND D = 2 THEN GOTO 500
      IF B = 5 AND C = 2 AND D = 5 THEN GOTO 500
IF B 5 AND C = 5 AND D = 5 THEN GOTO 500
220
240
      FB=9 AND C=9 AND D=9 THEN GOTO 600
250
260
      PRINT "UNFORTUNATELY YOU HAVE WON £0"
270
      PRINT
      PRINT "YOUR NUMBERS WERE ",B,C D
280
      GOTO 700
PRINT "YOU HAVE WON A PRIZE"
290
500
510
      PR.NT
      PRINT "YOUR NUMBERS WERE ": B.C:D
520
700
      PRINT "PRESS S TO PLAY AGAIN"
710
720
      INPUT B$
730
      IF 8$ = "S" THEN GOTO 10
740
      STOP
```

NEW RELEASES . . .

SPLAT! # ARCADE

CAN **SOMEONE** GUIDE ZIPPY THROUGH ALL 7 LEVELS TO THE EXIT? £500 AWAITS THE SPLAT CHALLENGER WITH THE HIGHEST SCORE £5 50

An Original & Entertaining game that gets you hooked

PCN

Also from Bulls

MOUNTAINS of KET

CO

ET

ME

O

IEN

1984



A GIANT OF AN ADVENTURE PROGRAM THE MANY FEATURES INCLUDE COMBAT INTERACTIVE BEINGS MONETARY SYSTEM FIRST YOU HAVE TO FIND THE MOUNTAIN & THEN -> AS WELL AS BEING A FAST INGENIOUS COMPELLING ADVENTURE IN ITSELF -- THE MOUNTAINS OF KEI IS THE FIRST OF A 3 PART SERIES THAT BUILDS INTO A MAMMOTH ADVENTURERS CHALLENGE

BY R A McCORMACK

£5.50

1984



GOVERNMENT

THE BRITISH ECONOMY WITH YOU AT THE CONTROLS WHAT SORT OF CHANCELLOR WOULD YOU MAKE THISEVERAL BILLION POUNDS TO SPEND & FIVE 'RS TO THE NEXT GENERAL ELECTION? GRAPHIC PLAYS. HISTOGRAMS & A ANNUAL PERFORMANCE MATING ARE ALL INCLUDED TO SHOW HOW YOU ARE DOING HOW MANY YEARS WILL YOU LAST?

ELECTED BYRMH CARTER £5 50

All programs run in the **48K 2X SPECTRUM** and are available from all good computer shops. In case of difficulty please order direct using the coupon below

TOP POYALTIES PAID OPIG NAL PROGRAMMES WANTED FOR ALL MAKES IF POPULAR HOME COMPLITERS

Please send melipiease rick SPLAT

PLAI

MOUNTAINS OF RET

1984

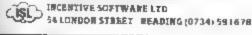
All at £5 50 each (inclusive of VAT and 1st class postage)
Lenclose cheque/PO for £ or please debit my

Access account no

	T T		
		1 1	
		4 1	

Name

Address,





SPECTRUM



Make the most of your Spectrum, with these acclaimed books from the experts!

- Hartnell Spoken word C 60 cassette with book containing many maior programs to teach you programming the Spectrum from first steps. The ideal guide fithe Spectrum is your first computer, £4,95.
- CREATING ARCADE GAMES ON THE ZX SPECTRUM Danie. Haywood Full programming instructions to improve and enhance your own work with 17 major programs listed in full as a bonus if 3 95
- PROGRAMMING YOUR ZX SPECTRUM IT in Hartne, and Dilwyn Jones 200 pages more than 100 programs to take your through programming the Spectrum from the beginning. Written by I'm Hartnell the most widery published ZX author in the world. Recommended by PCW Sinciair User and Personal Computer Today £6.95.
- BEYOND SIMPLE BASIC DELVING DEFPER INTO YOUR ZX SPECTRUM Driwyn Lones When you've mastered introductory programming on the Spectrum you need this oustanding guide to enhanced programming techniques and concepts £7.95
- 50 GAMES AND APPLICATIONS FOR THE SPECTRUM David Harwood Arcade games nterigent board games brain games and L11 ty programs they relat here. Just £4.95
- Hartnell Thirty great games for your ZX computer 15 for the Spectrum 15 for the 16K ZX81 On v £3 25

interface Publications

Dept ZC

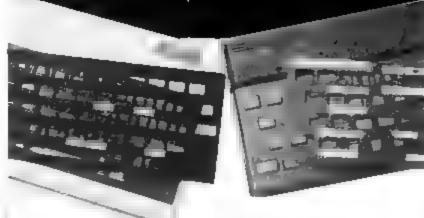
44 46 Earls Court Road Landon W8 6E J

Please send me the books indicated above enclose t

Name

Address





Everything you need IS on the keyboard with CLSTOM KEYPANELS

These precision die cui plastic panels fit perfectly over your keyboard and provide an instant and individual reference to all of your software.

Each Kit comes in a cicar plastic storage wallet and contains. IO Mart black Keypanels plus sheets containing over 140 sed adhesive Command labels pre-printed with words symbols and arrows plus a sheet of blanks for your own designs.

SPECTRE WIKEYPANETS are 96x22 imm and the labe sare printed in Spectrum bright red AMUST for flight simulation and an malti-sey games and applications.

The FIRST add-on for your Spectrum
ORIC KLYPANELS are 105 x 275 mm and the labe s
are ORIC blue Master these CTRL and FSC key
combinations.

An INSTANT reference to all ORIC skeyboard functions

NOW IN SUPERMEPHASTIC!

Post today to **Softeach Limited**, 25 Coffege Road, Reading, Berksburg, RG6 TQF

Please send me

Spectrum Keypanel Kits at £3.95 ± 35p p&p each towerseas should add 25 = for additional surface mail)

ORIC Keypanel Kits at £4.95 ± 35p p&p each toverseas should add 25 — for additional surface shall).

Tenclose atotal remittance of 2, orders payable to Softeach Limited.

cheques posta-

NAME

ADDRESS

N D

kemp

THE BEST BUSINESS SOFTWARE ON ANY HOME MICRO

"On a large computer system a file of this nature would cost between £150 £700."

P.C.S. Distribution

Sales Ledger Lp to 1200 entries per month

Purchase Ledger

17

Stock Ledger Stock Control

Unlimited entries

Only £14 95 each (48K Spectrum only)

Available at Selfridges and at all good computer shops

Nationwide wholesale distribution by Microdealer U.K. and P.C.S. Distribution.

Kemp Limited, 43 Muswell Hill, London N10 3PN

Hotline 01-444 5499

To all purchasers of Sinclair Small Business Account for ZX Spectrum

It has come to our attention that there is an error in some copies of the above program. We are anxious to minimise the inconvenience to purchasers and are therefore taking prompt action to inform you and offer a replacement free of charge.

If you have a copy of this program and it bears the code B6/S on the box spine please store any data on a separate cassette and then return the product with its packaging and user manual and your name and address to

Sinclair Research Ltd, Stanhope Road, Camberley, Surrey, GU15 3PS.

We will send you a replacement copy

Computertutor can give your child a head start with games that really make fun out of learning Children of loday are fascinated by computers. With micros atready used in schools throughout the country their involvement in education and in buildary lives is increasing ail he time To give young children a head start we ve created, with parents reachers and of course children the Cleve-Clugs series designed to appeal to child en in the 3-7 real bid age goup Help them develop basic shills slimulate imagination and inclease their sell confidence—ii ke simila ip oducis will confidence in the series products each Clever wilds program siters a wider inductive at games to play Andiesch game, an be made more difficult by simple adding of the rape and resetting new questions in this way you at keep ip with your child's progress, even link the questions into wolk they led ling a school The levir lings series can be used by your

whichid on their lawr with in tial help from you

somes of PARTY TIME (3 yrs + at £6.50 per land copies of JUNGLE JUMBLE (5 yes + et \$6.50 per tape copies of WHIZZ OUIZ 7 yrs +) at \$6.50 per tape

Price o leach program £6.50 Junivat P.& P. Overseas orders Elektro per tape for airmal delivery

Trade enquiries (avided

Plotter send me-

his

ter

ler

N

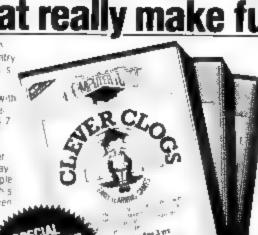
are

tion

оге

1984

96



MAKES FLN OLT OF LEARNING

With parent help even the firs will use the play these rangly games for an disk in the camples from the interpretation of the interpretation of the property event along with the property event along affects either with the property event along affects either with the property event along affects either with the property event and indicate an experience of the property event in the property eve

JUNGLE JUMBLE for Age 5 yrs +

a this age to provide type and questioner are recessary to mind will interest yibh sond oest experier es and will engly bischer unied meng that regged to a area os sonto de la

LEVER LINGSWEETER BERTHE STROTT UP & DIFFERENT AN ARTHUR. IN A 19-JU TOPE THE UP TO THE PLAYER FOR A 20-JULY TOLKE BIRD. BUTTE YOUR OWN URBING ZOIL THE BUTTE THE WEST STATES. THE POSSIBILITIES.

WHIZZ QUIZ for Age 7 yrs +

A gather in skill and change for ill players that win get your whiched thinking hard. But illever uplies if this age like a challenge. You can proceed from the general knowledge questions a treatly programment and you when there is reinformed upon all questions or your away there is reinfording scope here to the leafly lever it were Cloy. Watch there develop their arece. Bis and in a way that will rescribe you all much as them.

"Artin for 7% to 164

Card no

Postcode.

SPECTRUM JOYSTICK

"Also for ZX 81(16K) Computerfulne P.D. Ben J. St. Noots Huntingdon Cambo PLIS 38W Telephone 6480 213965

£9.95 includes VAT & PAP NO INTERFACE

NEEDED SPECTALM-STICK PERATES THESE

Sinclair Spectrum 7,1 14 54 د این ده د h ., .. .

enclose cheque PO payable to Computer tutor or please debut my credit card, for the Total C

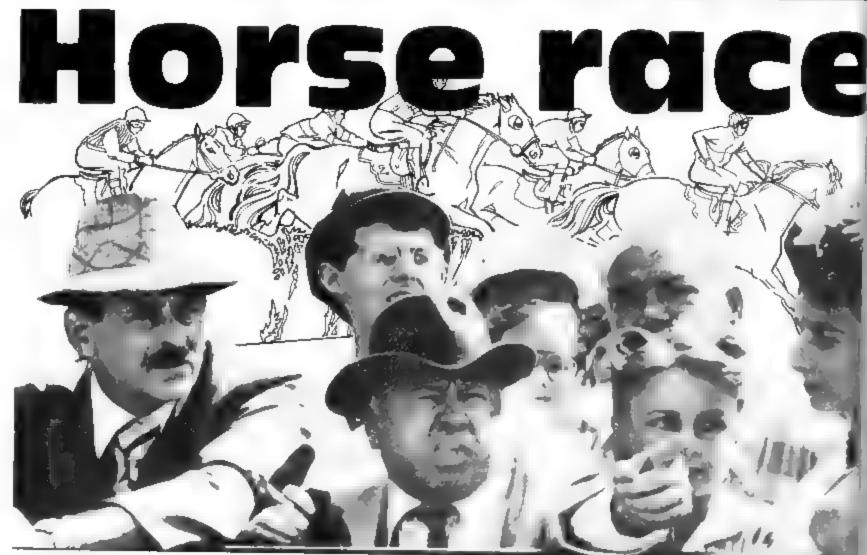
	,	7			
F	L			lı .	
			T		

machine code sort in your Spectrum BASIC

ALL-SORT simple to use brilliant

£9.95

Write for literature & stockists: Alan Firminger 171 Herne Hill, London SE24



This program allows a five furlong race to be held with five horses competing. You are first given the choice of which of the five horses you wish to be yours and then you are asked to type in your name as a sign of owner ship. The horses, numbered one to five, are presented to you and you must enter an owner's name for each of if you only want to name an owner for one horse, then for each anonymous

horse owner press the x' key and then Enter

When a horse has won you will be informed of the winner and the person who chose it, the program will also tell you if the horse had no backer. Should you wish to change the names of the horses to ones of your own it is can easily be done a tering the PRINT AT statements in lines 610 to 650.

Watch out for the fences!

Saddle up your Spectrum for this galloping good program from N C Pearson.

```
"HORSE RACE"
       REM
            *** BY N.C.PERRSON ***
       REM
      REH
    6
           GRAPHIC H FOR HORSE, GRA
      REH
      F FOR FENCE
CLS : BORDER
  a
  10 GG 5UB 467
20 GG TG 590
30 BRIGHT 1
                                        80
RBUR
SE
          INK Ø
      4 -
      REM
  33
      REM
           *** INSTRUCTIONS ***
     REM
              PRINT
                      AT
    Mg 5 5 5 5 4 4 5 5
     FLASH
PRINT
  38
                 PRINT
                 PRINT
                  THIRE
                d=0: LET
```

```
INPUT H$

IF H$="C" OR H$="C" THEN G
   70
           REH
     56
            REH
     57
                       *** TRACK ***
     58
     59
            PRINT BT 5,0;"
                                   6,0,"1",AT 6,10,"
AT 6,29;"F"
7,10,"F";AT 7,20,
            PRINT AT
6,20;"F";
PRINT AT
     65
     70
            PRINT AT 8,0;"2";AT 8,10,"
8,20;"F",AT 8,29;"I"
PRINT AT 9,10;"F";AT 9,20,
  90 PRINT AT 10,0;"3";AT 10,10;
F",AT 10,20;"F",AT 10,29;"N"
,95 PRINT AT 11,10,"F";AT 11,2
...............................
100 PRINT AT 12,0,"4";AT 12,10;
"F";AT 12,20;"F";AT 12,20;"I"
105 PRINT AT 13,10,"F";AT 13,2
 110 PRINT AT 14,0; "5"; AT 14
F", AT 14,20; "F"; AT 14,29; "S
115 PRINT AT 15,10; "F"; AT 1
```

```
16,10,"F";AT 16,20
 120 PRINT
                 AT
     , AT
           16,29,
 125
      PRINT
                        17
                       2,4,"F = FURLONGS"
4,1;"F-"
4,5;"B"
4,10;"B"
4,15;"B"
4,20;"B"
4,25;"B"
 130 PRINT
                  AT
      PRINT
 135
                  AT
 140
                  AT
                  AT
 145
      PRINT
                  AT
 150
      PRINT
      PRINT
 155
                  AT
      PRINT
 160
 171
      REM
 172
      REM ERE GAME REF
 173
       REM
 180 LET (=INT (RND+5)+0
185 PLOT 10,45. DRAW 0,90
190 PLOT 230,45 DRAW 0,90
  00 IF (=1 THEN LET a=a+1. IF
THEN GO TO 250
05 PRINT AT 6,10,"F",AT 6,20,
 200
                                                   IF r
   10 IF (=2 THEN LE) 5-2.
THEN GO TO 270
15 PRINT AT 8,10,"F",AT 8,20,
 215 PRINT
 220 IF r=3 THEN LET c=c+1.7 THEN GO TO 265
225 PRINT AT 10,10,"F";AT
                             LET c=c+1.
                                                   IF
230 IF r = 4 THEN LET d = d + 1
=4 THEN GO TO 300
235 PRINT RT 12,10,"F", RT
                                                   ĭF
                                                 12,20
 237 PRINT AT 14,0,"5",AT 1
F',AT 14,20,"F"
240 IF r=5 THEN LET 8=8+1.
5 THEN GO TO 320
                                                   TE
 241
242
     常臣州
      REM ### HOUEMENT ###
 243 REM
 250 BEEP 0.03/10
                                                  6,a;
                                 PRINT AT
 H", AT 6, a-1, " ."
255 IF a=29 THEN GO TO 348
265 GO TO 50
 265
270
      BEEP 0.03,14: PRINT AT 8,5,
 275
275
       T 8,5-1," THEN GO TO GO TO 50
      GO TO 50
BEEP 0.03,16: PRINT AT 10,0
                                           366
 286
285
  H"
     AT 10,0-1;""
IF 0=29 THEN GO TO 386
 290
      60 TO 60
 295
      BEEP 0.03,20 PRINT AT 12,0
 300
  H"
       AT 12,d-1," "
IF d=29 THEN GO TO 406
     AT
 310
       GO.
            TO 69
       BEEP 0.03,22 PRINT AT
                                                  14,€
     AT
       AT 14,e -1," "
IF e=29 THEN GO TO 426
 325
      GO TO 60
 340
 345
       REM
      REM ### WINNER ROUTINE ###
 346
 347
      REM
349 PAUSE 100 CLS
350 IF U$="" OR U$="X" OR U$=">
THEN PRINT AT 10,0," NUMBER 1
ON BUT NO ONE BACKED HIH" GO
                                         HIH"
TO 460
355 PAUSE 100 CLS
360 PRINT AT 10,0," THE WINNER
IS NUMBER 1 COLLECT YOUR WINNI
                                     YOUR WINNIE
365 PAUSE 100 GO TO 460
366 PAUSE 100 CLS
370 IF U$="" OR U$="X" OR U$=">
THEN PRINT AT 10,0," NUMBER 2
400 BUT NO ONE BACKED HIM" GO
375 PAUSE 100 CLS
380 PRINT AT 10,0;" THE WINNER
IS NUMBER 2 COLLECT YOUR WINNER
                                     YOUR WINNIN
 3 ", 45
385 PAUSE 100: GO TO 450
```

United

jo

Courtesy

ш

GO

** F

12 11

. 20

.0;

20

0;

20

1984

```
386 PAUSE 100. CL5
390 IF X$="" OR X$="X" OR X$="Y
THEN PRINT AT 10,0;" NUMBER 3
ON BUT NO ONE BACKED HIM": GO
 HON
 TO 460
 395 PAUSE 100 CLS
400 PRINT AT 10,0;" THE WINNER
IS NUMBER 3 COLLECT YOUR WINNING
   ", X$
405 PAUSE 100. GO TO 460
406 PAUSE 100 CL5
410 IF Y$="" OR Y$="X" OR Y$=">
THEN PRINT AT 10,0;" NUMBER 4
WON BUT NO ONE BACKED
                                                       HIH"
 TO 450
 420 PRINT AT 10,0;" THE WINNER
IS NUMBER 4 COLLECT YOUR WINNIN
425 PAUSE 100. GO TO 460
425 PAUSE 100. GO TO 460
426 PAUSE 100. CLS
440 IF Z$="" OR Z$="X" OR Z$="X"
" THEN PRINT AT 10,0;" NUMBER 5
WON BUT NO ONE BACKED HIM"
450 PRINT AT 10,0," THE WINNER
IS NUMBER 5 COLLECT YOUR WINNINGS ",Z$
                                                 YOUR WINNIN
   5 ", Z$
460 PRINT AT
 G5
                                 14,0;"
  465
          IF G$="Y"
                                                       IMPUT GS
                                    OR G$="y"
   TO 35
            STOP
   466
   467
            REM
                     ### USER DEFINED ###
            REM
   468
   469
            REM
           FOR J=0 TO 7
READ &
POKE USR "H"+J, &
   480
   490
   500
   510
            NEXT
520 DATA BIN 00001100,BIN 00011
000,BIN 01111011,BIN 111111111,BI
N 10111001,BIN 10011100,BIN 0010
0100,BIN 000110110
   530 FOR J=0 TO
540 READ 0
           POKE USR "F"+J,9
   550
560 NEXT J
570 DATA BIN 00011000,BIN 00111
100,BIN 00111100,BIN 00011000,BI
N 00111100,BIN 00111100,BIN 0001
1000,BIN 00111100
   580
           RETURN
           REM
   581
   582
            REM
                     *** HORSE CHOICE ***
   583
            REM
                      · PLOT 0,150
   590
                                                       DRAW 250.
             PRINT AT 2,0;" NO
 Ø
   500
            PRINT
                                                               NAME
           MOTTLED GREY"
PRINT AT 6,0,"
JET BLACK"
PRINT OF
   610
                                                 1
                                                            SUPERMA
N
   620
                                                            FINE TH
 T!M
   530 PRINT AT 8,0," 3
ILS MOTTLED BROWN"
640 PRINT AT 10,0;"
BE GREY/BROWN"
650 PRINT AT 12,0;"
BROAK BROWN"
                                                            GOLDENT
AILS
                                                              BREAKE
R BE
                                                               STONEY
BROAK BROWN"
670 PRINT
680 PRINT " YOU MAY PICK ANY MO
RSE.ENTER YOUR NAME FIRST IF YOU WANT 1 AND SECOND IF YOU WANT 2
E.T.C.IF YOU DON'T WANT THEM AL
L THEN ENTER X'S UNTIL YOU GET T
THE SET OF BRACKETS YOU WANT."
690 INPUT V$, W$, X$, Y$, Z$
   695
            PRINT
            PRINT "DO YOU WANT TO RACE
NOW ?"
   700
 THEM
            NOU
            INPUT G$

IF G$="Y" OR G$="4" OR
OR G$="YES" THEN GO TO
   750
800
                                                            OR G$="
```

Mastering Machine Code — part seven

We welcome back Toni Baker, author of 'Mastering Machine Code on your ZX81', who this issue completes the racing car game she started in the Aug/Sept edition.

Having spent virtually the whole of my article in the Aug/Sept ssue of ZX Computing introducing this program will not waste words providing more introduction. The program is called Racetrack and I hope you enjoy it!

I have chosen to document this program as I go through it, in the format of a small description followed by their elevant code

I hope you can all follow this

Throughout the article label names have been printed as hyphens. However, their correct notation for the Spectrum should be with an underlined dash. An example of this can be seen a little further in the text under the heading. STR 3—the data labels. C. CAR, and 'H. CAR', should have been presented as C. CAR', and 'H. CAR', hope this does not cause any problems.

RACETRACK This data represents the shape of the racetrack Each byte represents one step around the track. The first Hex digit is the position of the left hand wall plus two and the second Hex digit is the position of the right hand wall less 12h. So, for instance, the byte 96 implies that the left wall is at position 9 - 2 = 7, and the right wall is at position 6 + 12 = 18h

8010 96 96 96 96 85 85 74 63 52 41 30 30 30 30 30 30 8020 41 52 63 63 74 85 96 A7 B8 C9 DA EB FC FC FC 8030 FC FB DA C9 B8 B8 B8 B8 B8 B8 B8 B7 B7 B6 C6 8040 C6 C6 B5 A4 93 82 71 60 60 60 60 60 60 61 62 63 8050 64 65 66 66 66 66 76 76 86 96 A6 B6 B6 B6 C7 C8 8060 C9 C9 B8 A7 96 85 74 63 52 41 52 63 74 63 52 41 8070 41 41 50 50 50 50 50 50 50 50 50 60 60 60 60 70 8080 70 70 81 92 A3 B4 C5 D6 E7 F8 F8 F8 F8 F8 F8 F8 8090 F8 F7 D6 C5 B4 A3 A3 A3 A3 A3 A3 A3 A2 A2 A2 A2 80A0 B2 B2 C2 C2 C2 C2 D2 D2 D2 D2 D2 D2 D2 D1 D1 D1 8080 D1 D1 D1 D1 D1 E1 E1 E1 E1 E1 E0 E0 F0 E0 80C0 E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 DA CB BC BD BC BB 80D0 BA B9 B9 B9 C9 B8 80F0 A 7 B6 C5 D4 E5 F6 F6 E5 D4 C3 BZ A1 90 90 A1 B2 80F0 C2 C3 C4 B4 A5 A5 96 A5 A5 96 A5 96 96 96 96 96

STR 2 This represents PRINT TAB 7 "graphic shift 8 ,TAB 18, 'graphic shift 8 '

8166 17 07 00 8F 17 18 00 8F

STR 3 This represents PRINT AT 05,0A INK 1 car c IN 0' 'INK 2 car h' INK 0 The data C CAR compute sea and H CAR human sicar) are obviously notuded within this string (at addresses 8171 and 8180 respectively).

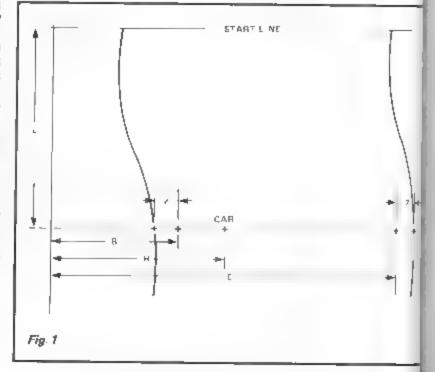
816E 16 05 0A 8171 10 01 8E 8D 14 01 43 14 00 8E 8D 10 00 817E 20 20 8180 10 02 8E 8D 14 01 48 14 00 8E 8D 10 00

TIME, DIST C and DIST H There are the strings AT 2.0 lb 0,PAPER 6 0000, etc which are printed in the information window during the game.

818D 16 02 00 10 00 11 06 30 30 30 30 8198 16 02 0A 10 00 11 06 32 30 30 30 81A3 16 02 16 10 00 11 06 32 30 30 30

The following are various calling points which PRINT AT various parts of the screen. The labels used are fairly self-explanation

81AE 3D AT 5,A 3 DEC A 81AF 3D AT 5 A 2 DEC A 30 DEC A 1605 AT 5 A LD D 05 1802 JR AT D A 81B5 1615 AT 15 A LD D 15 5F AT D.A LD E.A 1813 JR AT DE



MACHINE CODE

This subroutine will erase the previous image of a car from the screen if one exists) and moves the print position one square down ready to reigniting the car having moved forward if necessary it requires DE be the PRINT AT colordinates of the existing position of the car.

B. BA	COCD81 300D 3E11 D7	ERASE CAR	CALL AT D.E JR NC BANANA LD A paper RST 10	Print at D E if on screen Jump if not on screen
	3E07 07 0606 3E20	APPLE	LD A white' RST 10 LD B 05 LD A spece'	Print PAPER 7
	D7 10FB		AST 10 DUNZ APPLE	Overwrite with spaces
	14	BANANA	INC D	Move AT co-ordinates to next line
		AT D.E	8	Move print opsition accor

This subroutine moves the print position to AT colordinates D,E if this is on the screen. If this is not on the screen, the subroutine leturns NO CARRY.

dingly

8100	7A D604 FE12	AT D,F	LD A,D SUB 04 CP 12	
	DO		RET NC	Return if not on screen
	3E16		LD A, 'at '	
	D7		PST 10	
	7A		LD A,D	
	D7		RST 10	
	7B		LD A.E	
	D7		RST 10	Print AT D E,
	37		SCF	ndicate co-ordinates on screen
	09		RET	46.661

INK a car a str

o,INK ation

ribus ory

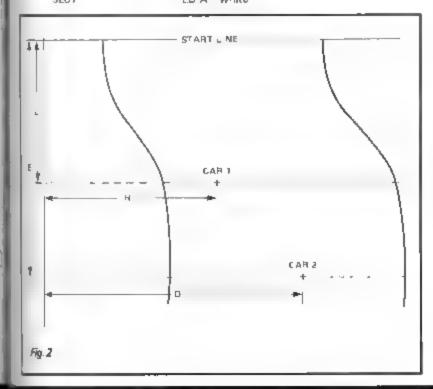
1984

This next subroutine is equivalent in PRINT AT 15h, A, igraphic shift B

81DC	CDB581 AT 15.A-G 3E10 D7	CALL AT 15 A LD A Ink	Pont AT 15h A
	3600	RST 10 LD A black '	
	07	RST 10	Print INK 0
	3E8F	LD A graphic	
		Shift B	
	D7	PS7 10	Print graphic shift 8'
	C9	RET	

The next subroutine will print either the human car or the computer car depending on which address it is called from

BIES	118081	PR-HC	LD DE.H-CAR	Point to start of string
\$ EE	17181 010000 3611 D7 3607	PR CC	LD DE C CAR LD BC 000D LD A paper ' RST 10 LD A white	Point to start of string BC = langth of string



D7 RST 10 Print PAPER 7
C33C20 JP PR STRING Print the appropriate car

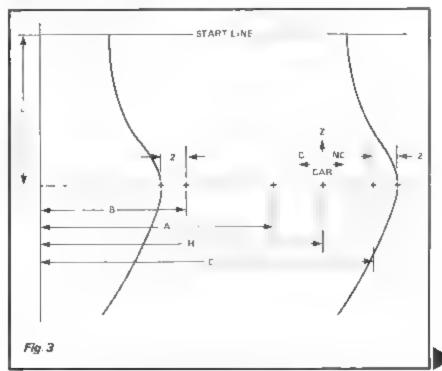
The next subroutine decrements either the human's distance to go or the computer sidistance to go if this distance reaches zero then the screen is inverted. The subroutine requires that Hupoints to the last byte of the string in question (e.81A2 for the computer, or 81AD for the human).

arFD	25 7E FE30	DEC DIST PEAR	PUSH HL LD A.(HL) CP 0	Stack address or last byte. A = nex digit
	2005 3639 28 8F6		JA NZ ORANGE LD HL/. 9 DEC HL JR PEAR	Jump unless digit equals zerb Change digit to nina and consider next digit left
	35 E1 E5 0604 3630	CRANGE	DEC HL POP HL PUSH HL LG B 04 LO A G	Dacrement digit NL address of ias: byte
	9E 28 20 1 0FA	STRAWBERRY	CP HL DEC HL JR NZ PEACH DJNZ STRAWBERRY	Check whather distance has reached 0000 Jump if you
	210040 7E EEFF	LEMÓN	LOM DEILE LOA HIL NOR EF	Point to its byte of access
	77 23 70		INC HL LO A H	rven Text dyte Pow to net byte
	FESB 20F6 CFFF		CP 58 JR NZ LEMON RST 08:DEF8 FF	Continue until end of screen reached Return to BASIC
	0 F6FF 09 0 0800 EB 033020	PEALH	POP HL LD BC FFF6 ADD HL BC LD BC DO008 EX DE ML JP PR-STRING	HL Points is last byte HL Points to first byte BC liength of string DE = address of string Print the string

This next subroutine finds the position of the racet ack walls at any point on the route. Referring to the diagram in Fig. 1, he subroutine finds B and C assuming that 1 is known.

8230	E5 2680	EDGES	PUSH HL LO H,80	Stack the initial value of H Mulipoints to byte in RACETRACK data
	7E 1F 1F 1F 1F		ED A (HL) RRA RRA RRA RRA	NACE! DACK USIG
	E60F 47 7E		AND OF LD B A LD A 104L	Squate first Hex digit Assign B as required
	E60F C810 4F E1 C8		AND OF ADD A 10 LD C A POP HL RET	Assign C as required Restore H

This next subroutine tests whether or not a car has crashed if requires that D.E. H and L are assigned as in Fig. 2, where car one is the car being tested, and car two is the other car. If returns ZERO if the car has crashed, or NON ZERO if the car has not crashed.



MACHINE CODE

8

8243	CD3082	CRASH TEST	CALL EDGES	Assign B and C to indicate the position of the
	7C B8 C8 B9 C8 7D BB		LD A.H CP B RET Z CP C RET Z LD A.L CP F	recetrack walls. Test for collision with left-hand wall Test for collision with right-hand wall
	7C 92		RET NZ	Exit unless lever with other car
	C604 FE09 3802 A7 C9 BF C9	LIME	SUB D ADD A,04 CP 09 JR C. LIME AND A RET CP A	A = distance between cars Are they in collision range? Jump f so Reset zero flag and exit Set zero flag
	GS		RET	Title bns

This next subroutine checks whether or not the human car has crashed. If so, then the screen will flash and the game will be over

825A	CD58806 CD4382 CO 210058 CBFE 23 7C	MELON	ESTED HL, HC) LD DE (CC) CALL CRASH- TEST RET NZ LD HL, ATTRS SET 7 (HL) JNC HL LD A H	HL = position of human car OF = position of complear Test for cresh. Return unless crashed HL points to attribute file Flash next square Point to next attribute
	FESB 20F8 CFFF		LD A H CP 5B JR NZ,MELON RST OB/DEFB FF	Repeat for whole of attribute file

This subroutine checks whether or not the Space key is depressed at any instant. It returns NO CARRY if the Space key is pressed, and CARRY otherwise.

8272	DBFE	SPACE KEY	ID A 7F IN A (FE)	Scan segment 7 of the
	1F C9		RAA RET	keyboard. Move SPACE bit into carry

The purpose of this next subroutine is to print a space character (a white square)

8278	3£11 D7 3E07 D7 3£20 D7 C9	PR SPACE	LO A paper AST 10 LD A, white AST 10 LD A space AST 10 RET	Print PAPER 7
------	--	----------	--	---------------

And now for the interesting parts. This subroutine moves the human car left or right as required.

LOAFE

DBFE	ric En	IN A (FE)	Scan segment 0 of the
16		RRA	keyboard. Move Caps Shift bit
3815 CD7282		JR C GRAPE CALL SPACE KEY	Into carry Jump if Caps Shift pressed
CO		RET NO	Return unless Space
3AAF5C		JD A (HC-H	pressed A = horizontal co-ordinate
CDAE81 CDE981 CD7882 FD3675		CALL AT 5 A 3 CALL PR-HC CALL PR-SPACE DEC HC H,	of centre of human car Prior AT 5 A 3 Prior human car
1BBC		JR H-CRASH	ordinate
CD7282	GRAPE	CAL SPACE	Check for crash
Ca		RET C	Return if both Caps Shift and Space pressed
3AAF5C		LD A,(HC-H)	together A. = horizontal co-ordinates
CDAF81 CD7882 CDE981 FD3475		CALL AT B,A 2 CALL PRISPACE CALL PRIHC INC IHCIH	Of car Print AT 5 A. 2



18A7 JR H-CRASH-TEST Check for crash.

This subroutine assigns A, B and C as in Fig. 1. A returns the position of the exact centre of the racetrack at that point. The subroutine also returns ZERO if the car is already at the centre CARRY if the car is to the right of the centre, and NO CARRY the car is to the left of the centre. The subroutine requires H and to be previously assigned.

8283	CD3082 CENTRE	CALL EOGES	Assign 8 and C as
	78 81 CB3F	ADD A.C SR. A	required
	BC C9	CP H RET	A = (8 + C) 2 Assign flags.

This next subroutine works out the print position of the computer's car it assumes that at the start of the routine HL contain the co-ordinates of this car, and DE the co-ordinates of the human car it will also store the car's co-ordinates

32BC	70 93	POSN	LD A L SUB É	Store co-ordinate A = vertical co-ordinate. A = vertical distance
	C605		ADD A 05	A Y co ordina e o prei
	57 50		LODA	E = position of levice of
	1D 1D		DEC E	E = x co-ordinate of print

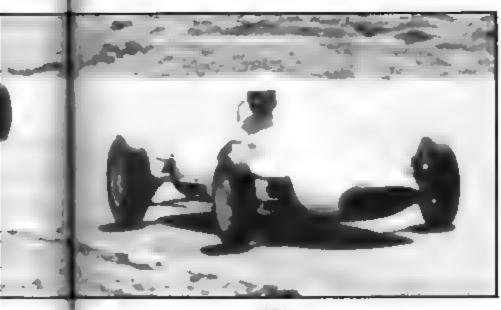
This next subrouting moves the computer car left or right as a quired. It identifies two different cases. (i) if the human car is the vicinity, and (ii) if the human car is not in the vicinity. Each case uses its own algorithm.

32C8	2A805C E05BAF9 78		LD HL (CC LD DE HC) LD A.E	A = vertical co-ordinates
	95 3C FE10 3805 CD8382 1812 E9 CD8382 EB 7A	PINEAPPLE	SUB L INC A CP 10 IR C PINEAPPLE CALL CENTRE JR GRAPEFRUIT EX DE HL CALL CENTRE EX DE HL LD A D	human car A = distance between on
	3805 81 C604 1803 80 D604 1F BC C8	MANGO PLUM GRAPEFRUIT	JR C MANGO ADD A C ADD A O4 JR PLUM ADD A B SJB 04 RRA CP H	Jump I human car is to the right of centre A = centre of larges gip Return if no movement
	3802		JR C GOOSEBERRY	Jump flatt movement arequired

6282

3EFF

HC LB



24 24		NC H	
25	GOOSEBERRY		H = new co-ordinate of centre of car
08		EX AF AF	Store flags.
CD4382		TEST	Test for crash
€8		RETZ	Don't move if it would cause a crash
CDBC82		CALL POSN	Find print position of ca
08		EX AF AF	Restore Lags
3608		JR C.DAMSON	required movement
1D		DEC E	
CDCD81		CALL AT DE	Print AT DE (for screen)
00		RET NO	Return 1 off screen.
CD7882		CALL PR- SPACE	Print a space
C3EE81		JP PR CC	Print computer call and
CDCD81	DAMSON	CALL AT D.E	Print AT D E of on
DO		RET NC	Return I not on screen
CDEEB1		CALL PRICC	Print computer car
C37882		UP PRISPACE	Print a space and exit

This next subroutine moves the human car downwards

FD5E75	HC-DOWN	LD D OS LD E (HC.H DEC E DEC E	
CDBA81		CALL ERASE CAR	Overwrite old car
CDE981 FD3474		CALL PRINC INC INC V	Print new car below it Change vertical co- ordinate
CD5A82		CALL H-CRASH- TEST	End game if crashed
21A081		LO HL DIST H+	
CDFD81 0613		CALL DEC DIST	Decrement distance to go
CDOE DO 3AAE 5C		LD A HC VI	Scroll lower part of screen
6611 66		LD L A	L = vertical co-ordinate of new line visible
C03082		CALL EDGES	BC = wall positions at this point
78 30		DEC A	
CDDC81 79		CALL AT 15 A.G.	Print left wall.
3€			
3C C3DC81		JP AT 15,A-G	Print right wall and exit
	FD5E75 1D 1D CDBA81 CDE981 FD3474 CD5A82 21A081 CDFD81 CG13 CDOE00 3AAE5C CG11 6F CD3082 78 3D 3D CDDC81 79 3C 3C 3C	FD5675 10 10 CD8A81 CD6981 FD3474 CD6A82 21A081 CDFD81 0613 CD0600 3AAE5C C611 6F CD3082 78 3D 30 CDDC81 79 3C 3C	FD5675 ID F (HC H ID DEC 6 DEC 6 DEC 6 CD8A81 CALL ERASE CAF CALL PR-RC INC HC V CD6A82 CALL H-CRASH TEST LO HL DIST H + OA CDFD81 CALL DEC D ST LD B 13 CD0F00 CALL CL SCROLL JAAF5C LD A HC VI AOD A 11 BF CD3082 CALL EOGES TB SD DEC A DEC A CDCDC81 CALL CL SCROLL AND A 11 CD A B DEC A DEC A DEC A CODC81 CALL AT 15 A-G LD A C INC A INC A

And this subroutine moves	the computer	car downwards
---------------------------	--------------	---------------

And th	nis subrodune move	s the compute	Cal down wants
8345	ZABOSC CC DOWN 2C	LD HL (CC) INC L	⊾ = new vertical co ordinate
	EDSBAFSC CD4382	LD DE, HC CALL CRASH TEST	ordinate.
	C0	RET Z	Exit if this move would crash
	CDBC82	CALL POSN	OE = PRINT AT co- ordinates

15 COBA81	DEC D CALL ERASE CAROVerwrite previous car	
DCEE81	CALL C.PR-CC Print new car flor scree	n
21A281	DHL DIST C+ Point to last byte of strin	
C3FDB1	"P DEC-DIST Decrement distance to g	

The overall computer's move is therefore produced by the follow ing subroutine

8362		MOVE-CC	CALL CC DOWN
	C3C882		"b CC-FB

The following routine tests whether or not the accelerator (Symbol Shift) key is pressed, and exits if it is not, after a short pause

8368	CD7282	MOVE HC-A	CALL SPACE KEY	A = scan of keyboard
	1F		FRA	Segment 7 Move Symbol Shift bit into carry
	3009		JR NC MOVE HO	Jump I Symbol Shift pressed
	010008 08 78 B1 20FB C9	DELAY	LD BC 0800 DEC BC LD A.B OR B JR NZ DELAY RET	p
		MOVE HC	6	

And now the overall human's move can be produced, thus

)1383 I 18282	MOVE H		. HC-DDWI C-⊾R
--	------------------	--------	--	-------------------

The whole program may now be written. This is the start of the program - USR should point to this address

8370	213030 229481 229681	START	LD HL 3030 H = L = 0 LD TIME + 07) HL LD TIME + 09) HL TIME = 0000	
	22A181		LD DIST C + 09	
	22ACB1		LD DIST H + 09)	
	213230 22 9 F81		LD HL 3032	H = 0 L = 2 DIST C = 2000
	22AA81			DIST H = 2000
	210013 22AF5C		LD HC: H.	Assign initial human colordinates
	260C		LD (CC) Hs	
	22B05C			Assign initial compico ordinates
	AF 323C5C		LD (TVFLAG) A	Print to upper part of
	040500		D 80 0000	screen
	110081		LD BC 0066 LD DE STR-1	
	CD3C20			Print information window
	0612		D812	The contractor will don't
	C5	CHERRY	PUSH BC	
	010800	-	LD BC 0008	
	116681		LO DE STR 2	
	CD3C20		CALL PRISTRING	Print walls
	10F3		DJNZ CHERRY	
	011F00		LD BC 001F	
	116EB1		LD DE STR-3	
	CD3C20		CALL PRISTRING	Print cars
B3C5	CD6283	MAIN LOOP	CALL MOVE CC	
	CD7783		CALL MOVE HO	
	CD6283		CALL MOVE OF	
	CD6883		CALL MOVE HC-A	1
	CD6283 CD7783		CALL MOVE HO	
	CD6883		CALL MOVE HE A	
	219781			HL = points to asi byte of TIME
	7E	TOMATO	LD A HU	A = next digit
	FE39		CP 9	
	2005		JR NZ RASPBERRY	
	3630		"D Hr. O.	
	ZB		DEC HL	
	1866		JR TOMATO	
	34	RASPBERRY	NG HL	încrease digit
	118081		LD DE TIME	
	010800		TD BC 000B	C Thu
	CD3C20			Print TIME string.
	1802		JR MA N LOOP	

st gap rent ien?

rns the nt The centre, ARRY if

and L

e com ontains of the

inate

of print

ire of

1 print

t as rear is in / Each

nate of en cars

CIP LY ter car

car

80

'NOW WIN THE POOLS'

THIS IS MEANT FOR YOU - I SPECIALLY IF YOU USE SINCLAIR SPECTRUM COMPUTER, or even ANY COMPUTER - OR NO COMPUTER AT ALL

HAVE YOU EVER HAD THAT DREAM OR EVER WISHED THAT YOU HAD "WON ON THE POOLS"

AT LAST YOU CAN TURN IT INTO REALITY

THERE IS A SECRET OF 'HOW TO WIN ON THE FOOTBALL POOLS" IT CAN BE DONE. I DISCOVERED THE SECRET A LONG TIME AGO - NOW, FOR THE FIRST TIME I'M PREPARED TO SHARE IT WITH YOU

HOW DOES THIS INTEREST YOU — I HAVE DOCUMENTARY EVIDENCE BY WAY OF POOLS WINNINGS DIVIDEND SLIPS/ CANCELLED CHEQUES, etc., SHOWING MY PRESENT WINS ON THE POOLS AS FOLLOWS —

First Dividends Second Dividends Third Dividends Fourth Dividends Fifth Dividends Sixth Dividends 765 1,818 2,942 1 952 631 93

A GRAND TOTAL OF 8,201 (EIGHT THOUSAND, TWO HUNDRED AND ONE DIVIDENDS - 50 far).

I ROLD THE UNCHALLENGED WORLD'S RECORD FOR POOLS WINS

I AM MAKING THIS YERY SPECIAL, REDUCED PRICE OFFER TO READERS OF ZX COMPUTING FOR A LIMITED PERIOD ONLY

Do not let anyone teil you that it is impossible to WIN ON THE POOLS since I perfected my method I HAVE WON REGULARLY for over TWENTY FIVE YEARS proof that it is no fleath-to the-pan

I have CHALLENGED THE WORLD with my record of wins and with all the evidence that I possess NO ONE has ever been able to accept the Challenge TENOW NO ONE EVER WILL

MY SECRET IS NOW PLACED ONTO COMPUTER CASSETTE FOR YOU

THE METHOD IS THE GREATEST TREBLE CHANCE WINNER IN THE HISTORY OF FOOTBALL POOLS. IT WILL AST FOREVER. BOTH FOR ENGLISH AND AUSTRALIAN FOOTBALL POOLS, WITH EQUAL SUCCESS.

I now intend to give a limited number of people the opportunity of making use of my method—perfected over 25 years and proving use floo EVERY ONE.

OF THOSE TWENTY-FIVE YEARS

You will have noted details of my personal achievements to far as given to you above

A GRAND TOTAL of 8,20 yes 8,20 POOLS DIVIDENDS, including 765 FIRST DIVIDENDS.

My Pools Winnings Dividend stips now number so many that hey fill a very large suitcase and win mand as my evidence of all claims in ANY COURT OF LAW IN THE WHOLE WORLD

Taking just the past 25 years into consideration, a have won ON AVERAGE over 328, (THREE HUNDRED AND TWENT) EIGHT) Pools Dividends EVERY YEAR or AN AVERAGE of over SIX DIVIDENDS EVERY WEEK for TWENTY—FIVE YEARS.

You have my absolute Guarantee of the complete authenticity of every claim, cheque document setter etc. contained here n

I do have fosing weeks, but ON AVERAGE my winnings show over SIX DIVIDENDS EVERY WEEK for the past 25 years

I know that you are now when y flabbergasted, it always happens to everyone with whom I come into contact. Please just sit back and imagine for a moment my FIRST DIVIDEND wins alone—rhey now number 76% (seven hundred and sixty-five) and will prohably be even more by the time this advertisement appears in print.

I AM NUMBER ONE IN THE WORLD AND NO ONE DISPUTES IT

For as using as a continue to enter the Footba. Poots my wins will continue I have already said they apply, with equal success to both English and Australian Football Seasons.

I intend to release a STRICTLY LIMITED NUMBER of copies of my casset e. DO NOT DELAY AND FINITY OF ARE TOO LATE in which case I would have to refund your money.

I am so confident of **YOUR** success that a do **not** win at teast. THREF FIRST TREBLE CHANGE DIVIDENTS in the first 20 weeks of entering, I we completely cancel the balance of the purchase price and you do not have to pay me another penny at any time, no matter how yast your winnings.

a only wish the space would allow me to give you photographs of my winnings slips, cancelled chaques, etc. but this of course impossible they now number 8,201 a sidends. I have however given JI ST A FFW EXTRACTS from ORIGINAL LETTERS. I hold from my small Chapter.

I am the inventor and Sole Propletor of my method. Registered as FLRFKA I have found of) am known as The Professor in Pools Circles am of the Highest Rank in Foretasting his is beyond dispute a am inarketing a minute outliber of Lompute Casset es, under my Registered Company

FOOTBALL ENTERPRISES

My mina charged the copy was \$75 hor for the SPECIAL REDUCED PRICE DEFER I was send you a copy of \$120. Wents pounds) ONLY plus your Promise is pay the the basance of \$55 ONLY OF YOU WIN AT LEAST THREE FIRST TREBLE CHANGE DIVIDENDS IN YOUR FIRST TO WEEKS OF ENTERING Substitutes you now me NOTHING FURTHER

This is surely proof absolute of my supreme and after confidence in my own abilities and in the capabilities of my discovery. I could easily CHARGE 12,000 per cassette on the evidence I possets, but that would not be fair to everyone which it what I want to do

My method a WORLD COPYWRIGHT any ofringement and immediate proceedings will be taken, without prior warning It is truly ingenious and has stood he rest of time.

My assette is simplicity iself to operate and you'd be given Ff T L DETAILS for weekly calcularing. Your entry need not overview you in any large weekly stakes, you can enter for as sittle as 25p. If you wish

I charge NO COMMISSION on any of your wins no matter how BIG they may be

teaused a long time ago, hat it was no good solling down and dreaming about winning the pools, so I but the vandle is both ends, working late into the night occasionally RIGHT THROUGH THE NIGHT ANEW there was a way, eventually paid off and has been doing so ever since

, am unable to vary my offer to anyone, so please do not request—as I shall very easily dispose of the cassettes I have prepared and am making available

IMMEDIATELY I perfected the method I commenced working right away, these with sust a little £ 63, the little week £ used it. I HAVE NEVER LOOKED BACK SINCE amongs at those dividends was one for over EIGHT THOUSAND POUNDS or use one eighth of a penny stake.

I will release a copy on assette to you, on receipt of the completed order form and your Signature thereon, confirming you will treat it in the STRICTEST CONFIDENCE between us and retain it for your **OWN USE ONLY**

PLEASE NOTE

If you happen to be the productionner. In Computer other than Sciela is Spectrum, you can star purchase as sign of my the same bridge and program, YOURSELD, IN YOUR OWN COMPUTER, or even flyou do not have a sample.

Don't take my word for it read what people write about me and my method

I twon on Zetrers tast meckend. It was not a big sum, but the same it was a very nursurprise for me.

I appreciate the straightforward method van adaps which s such a concrast to the rubbish of misrepresentation which is so common in the Hetring World, by unscappion and self-opiniomated chartetions.

Winnings cheque received today, oncere thanks

DN Deven

I congratulate you on your achievement

P D W.

I should tike to thank you for a most exciting teason and look torusers to heaving from you again. $J \sim Hanes$

Many thanks for your system, it is all you say and more.

J C Lancs

Your wonderful system won me £3,527. I intend to visu London won and will be able to come and see you personally (Overseas Cicert). P.M. Kampa,a

Many thanks for trying so hard to please us all, your brother should be thanked also One of our daughters, WHOSE HUSBAND YOU HELPED ENORMOUSLY has just phones, the tour of them have just spent a lovely holiday in Spain

K.R. Jaic of Man

I sent in my FIRST entry ast week and won 2nd and 3rd dividends, as you will see trom the enclosed critificate. One more and I would have collected over \$1000 for FIRST dreadend. Once I've won a fair amount I than be dahing from winnings and a 2p per one. A FIRST DISTORN has week as he would have been over £2,000.

A Yerks

I am very interested indeed and envious £20 herewith. I agree to pay you the balance of £55 ONLY if I will all least THREE FIRST TREBLE CHANCE DIVIDENDS in my firm 20 weeks of entering—otherwise cowe you NOTHING FI RTHER at any time—no matter how much money I win My Signature below is my I indemaking to retain complete and absolute confidence about the method.

Name

Address

5.gnature

XZ1

The Managing Director, Football Enterprises, 'Anvon', P New Road, Haverfordwest, Pamba.

Please took of cassette is for Sinclair Spectrum (48K) Any other Computer No Computer in all

Bookshelf

The Sinclair Spectrum in Focus — Mark Harrison

The Sinclair Spactrum in Focus is probably the best of all the books have looked at in this issue Suitable for all Spectrum users from beginners to those who already have some programming expertise and perhaps too, programmers of other mach nest

It is not a simple book and does not belittle difficult lopics but its achievements are worthy of a little study Neither s it a book aimed at scademics for while Mark Har ison's handing of topics can ana ytical and mathematical, he has taken tare to assume Ittle and explains new theory in a precise, logical and understanding fashion On completion, the reader should have knowledge of the principles of a computer system number systems used by computers flow charts Spectrum BASiC and logic control statements and functions an understanding of graphics and colour and their use in screen displays, to men tion only a few. To add to this there is a list of good quality games and util ty programs

We influstrated, egibly printed and well explained throughout its 180 pages, The Sinclair Spectrum in Focus is highly recommended

Published by Sigma Technical Press The Sincliar Spectrum In Focus is written by Mark Har nson and costs £6 25 ISBN 0 905104-28-5

Dynamic Games For The ZX Spectrum — Tim Hartnell

Dynamic Games For The Spectrum by Tim Hartneil's typical of many books of this kind Whether it will appeal to you depends on how many games you already have in your collection and your opinion of the twenty here. On comparison,

Looking for something to complement your bookshelves for Christmas? Patrick Cain takes a look at a selection of the latest titles....

they stand up well Tim Hartinels is undoubtedly the foremost Sinciair author and he has compiled a good variety of programs in this book. The games subdivide into four categories arcade games, board games adventure simulation games and 'improve your mind games, though I'm afraid none of them are very or gina.

Each program is supported by introductory text, which details the highlights and programming techniques employed Learning this way can be both fun and profitable. There are some great games, but games such as 'Checkers', '3D Drive and 'Death Race 2000' are more typical, although well suited in their degree of complexity to this type of learning. Books of this nature are useful programming aids but at a price of £5.95 there may well be others that serve the same purpose more econimically

Oynamic Games For The ZX Spectrum is compiled by Tim Hartneli and published by interface ISBN 0 946195 137

Games For Your ZX Spectrum — Peter Shaw

This is without doubt a full and I vely book. Crammed into its 125 pages there is a section on how to write better programs a bibliography, a glossary of computer associated terms and as the title suggests, and by far the biggest section, a collection of 23 good quality games.

As the author, Peter Shaw, points out, he has not included any simplistic space wasting games Those that he has included span a good range of game types 'Ascot , Pontoon' 'Draughts', 'Dam Busters' and 'Hangman are typical. Few of the games are too good to be improved upon and perhaps the scope that this leaves adds more to the book siva ue. All programs are written in BASiC, in a style which is simple to follow and will by example teach good technique Equally easy to follow are the 1st ngs which, while being dumped to print to ensure correctness, are clearly printed

Unfortunately, the other sections are of little value and serve only as padding to what is a good collection of software.

Games For Your Spectrum s written by Peter Shaw, published by Virgin and is excellent value at £2 95 SBN 0 907080 847

20 Simple Electronic Projects for the ZX81 and Spectrum — Stephen Adams

Computers can, as science fiction and advertising suggest, be used when interfaced correctly, to control





an endiess variety of physical devices. All too often their full potentia is not realised gnorance or myths about the complexities of such implementations prevent most capable users from venturing into this area of application 20 Simple Electronic Projects For The ZX81 and Spectrum by Stephen Adams should put an end to any apprehension. The contents of the 100 or so pages instruct on the construction of a burgar alarm, a light pen and an analogue digital converter and a further 17 projects, the theory and techniques earned will provide for countiess more

Each topic is accompanied by full descript ve text, clear and logical illustrations and background notes where necessary. Stephen Adams' treatment of the subjects should make them both comprehensible and appealing to anyone who has sat through a couple of years of school physics.

Now in its second addion 20 Simple Electronic Projects for the ZX81 and Spectrum was a success the first time around and it may well be for you Pub! shed by Interface Publications

Delving Deeper into Your ZX Spectrum — Diwyn Jones

Beyond Simple BASIC Delving Deeper into your ZX Spectrum is the full title of this new book by D wyn Jones Jones is one of the notables of the Spectrum world author of several books and regular contributor to the computer press, and well qualified to write such a book. Aimed at users who have mastered simple BAS,C and who wish to further develop their own programming, this book is crammed with useful tips and techniques that will enhance each program

n just over 200 pages, the author has compiled a battery Spectrum do's and don to can's and can'ts that will bring realism and profess onalism to programs from understanding the system's memory or screen output to screen tricks, each section is described and explained in a clear and friendly way On completion, your own skills should have developed sufficiently to write your own arcade software Just in case it hasn't, six programs are included to show how it ought to be done

Published by interface as part of the series 'Success in the Fast Lane' Delving Deeper into your ZX Spectrum is a worthwhile addition to Dilwyn Jones' titles ISBN 0 907563 24 4

Spectacular Games For Your ZX Spectrum — Hai Renko/Sam Edwards

Any book with a title ke Spectacular Games For Your ZX Spectrum will a ways stirme to search and deny any claim. With this one, it wasn to difficult few of the games included in the 130 odd pages came close to being spectacular.

Each game was accompanied by same narrative, but this merely attempted to briefly describe the game and was of no instructive value The illustrations were simple and, while often funny their relevance sin question Of the games, 'Kentucky Derby' 'Las Vegas A Go Go' 'Treasure Hunt' are all treading a weil worn path Perhaps t is because the authors. Hat Renko and Sam Edwards

wrote the book in Finland and away from the UK softwar market that many of the other programs while simple and uninvolved, are nove and good fun to play. Not the first book would rush out to buy but certainly one I'm glad to have in my collection.

Spectacular Games For Your ZX Spectrum is published by the Addison Wesley Publishing Co, written by Hal Renko and Sam Edwards and costs £3.95

SBN 0 201 14667 3

Creating Arcade Games On Your ZX Spectrum — Daniel Haywood

Creating Arcade Games On Your ZX Spectrum by Danie Hay wood is atmed a Spectrum users with a confident knowledge BASIC and perhaps an inking of machine code its purpose as the title declared is to show how games of arcade standard are created. As such, it is nothing new but credit should be given to its patient approach and the way it develops its topics by theory and example.



BOOK REVIEWS

Many books of this type go few of the games further. here, alg. Squash or 'S'alom', are possible rivals for However as an Pacman instruction book it does its obwell and the author shows real understanding of readers possible problems when introducing new techniques like PEEK POKE and Scroling Sadly many of the istings are difficult to read and maybe more thought could have been given to dividing the book into logical chapters and indexing

ware

other

and

good

ook I

but have

Your

d by

hing

and

osts

od

On

aniel

at

ASIC

Of

e, as how

dard

1 15

bluo

ient

eory

Written by Daniel Haywood, Creating Arcade Games On Your ZX Spectrum is published by interface runs to 160 pages and all the programs contained will run in 16K ISBN 0-907563-287

First Steps With Your Spectrum — Carolyn Hughes

First Step With Your Spectrum by Carolyn Hughes is a 125 page reader aimed at getting new Spectrum users particularly the young, through those first few difficult hours when everything is so tremendously complicated to

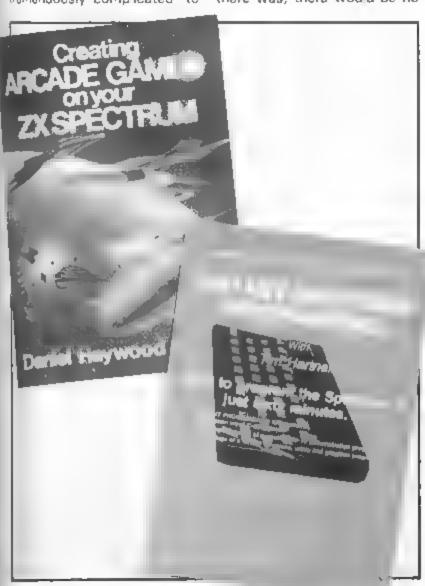
an understanding of programming technique and a familiarity with the computer. The book achieves its aims by being aware of the readers problems, assuming nothing and most importantly being fun.

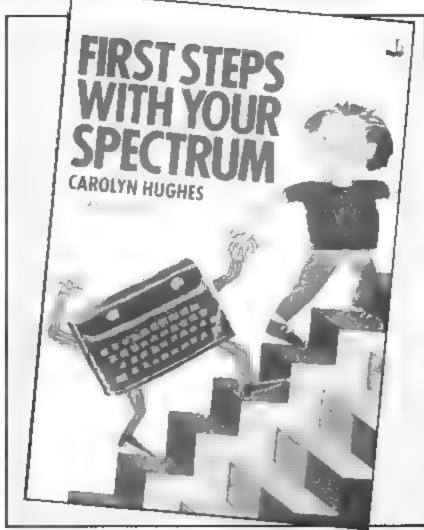
From a brief chat on what computers do the text continues to make sure that everything goes in the right place when the unit s assemb ed to vivid descriptions of the use of Spectrum BASIC, to finally some simple but worthwhile games Each topic is clearly and devery flustrated using wherever possible pictures nstead of words the effect being to make each point enjoyab e and more memorab e

Suitable for kids of any age First Steps With Your Spectrum s written by Carolyn Hughes, published by Armada and costs £1 25 SBN 0 00 692240 6

Instant Spectrum Programming — Tim Hartnell

There can be no such things as instant programming. But if there was, there would be no





better person to prepare such a package than Tim Hartne! Another of many books on Sinclair machines Mr. Hartne has put together a kit consisting of a one hour cassette tape and accompanying book, that will go a long way to help user gain elementary programming skills. And after that a selection of 30 games, utilty and graphics programs.

The tape is novel, but effective It is clearly defined and well produced and introduces the listener to each of the machine's keys, their functions and with short programs highlights how they The can be implemented dialogue and listings of those programs are included in the reader. The combination of both results in an effective and quick programming aid. It is regrettable that the program listing, dumped from ZX printer to ensure accuracy are often indistinct and detract from a good overall deal

Published by Interface, Instant Spectrum Programming s 124 pages of reasonable games and detailed elementary programming steps complimented by an excellent C60 instruction tape it is written by Tim Hartnell and costs £4.95 ISBN 0.907563-22-8

Easy Add On Projects for Spectrum, 2081 & Ace — Owen Bishop

Fasy Add On Projects for Spectrum ZX81 & Ace by Owen Bishop is one of those Ittle pocket size books by Babani Publishing that I have often raved about in this column

Like the rest, this one is packed from cover to cover with really useful information presented in a fashion that is enjoyable to read and not too demanding. The aim of the book is to extend your micro Spectrum, ZX81 & Ace, each is catered for equally well beyond the leve of running games programs to a small real time computer unit with practical applications Each project covers the building of periphera apparatus, nterfacing, application programs each s well explained and all the projects, 'Lightpen' to 'Rain Detector, should be within the grasp of anyone who has mastered BASIC programming

Easy Add-On Projects for Spectrum, ZXB1 and Ace is a 180 page reader of computer applications it is published by Bernard Bambani and costs £2.75 SBN 85934-099-6

Five card trick



This program is a version of the card game ipontoon for you to type in on your ZX81.

noted ng at the main teatures of pontoon, the program starts you off with £50 to gamble and the game will continue until you run out of cash

Twisting the night away

As in the card game, you will be dealt als nigle card on which you must decide how much you would like to place a bet. Your second card will then be dealt to you. Should you be dealt two aces the program automatically.

Play your cards right in this ZX81 game written for us by Kenneth Law of Dunbartonshire.

assumes the first ace is worth one and asks you whether you would like the second ace to be worth one or 11

With two cards in your hand you must decide whether you want to stick with your hand or 'twist'. If you istick, it means

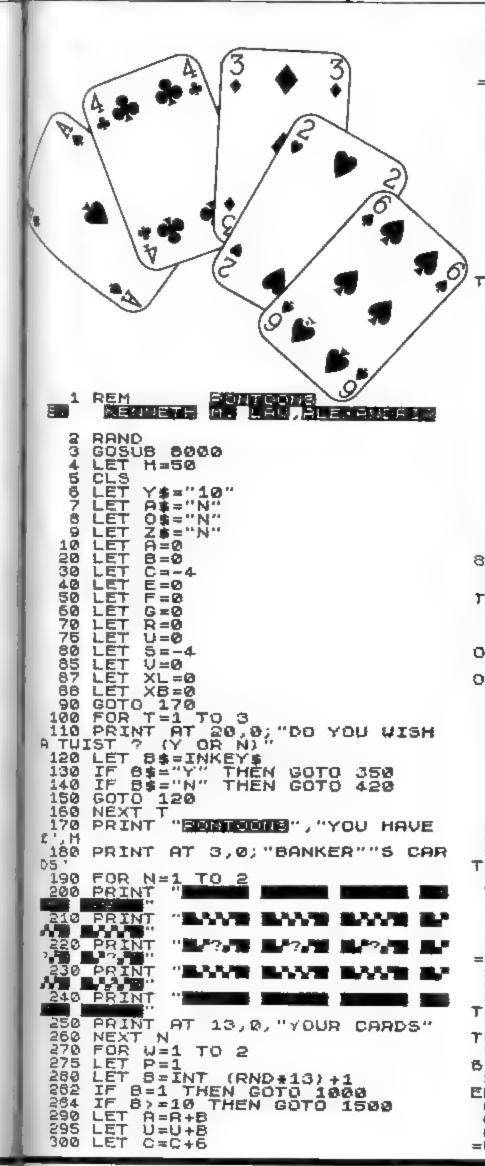
you are happy with your hand as tilestands and do not require another card. Should you not have enough points in your hand you can twist, which means you are dealt another card, which will get you nearer the magic number of 21. Should

your cards total more that it the computer will tell you that you have busted

Once you have stack with your hand, the computer will work out its own hand and you will be to d whether you have won or not in the even of you and the computer both having hands which total the same he computer will win it is known in the trade' as banker's advantage.

When you decide you have had enough of beating the computer at its own game, or you've been absolutely thrashed and you've lost all your money you will be to diyour ranking as a

pontoon player



```
IF C=2 TH
  319
315
320
330
                        THEN GOTO 900
                A=21
                          OR U=21 THEN LET AS
 ="0"
   340
          IF A<=21 OR U<=21 THEN GOTO
   100
          FOR
   350
351
353
                  K=1 TO 3
                  P=2
           RAND
          LET B=INT (RND *13) +1
IF B=1 THEN GOTO 1000
IF B>=10 THEN GOTO 1500
LET A=A+B
LET U=U+B
LET C=C+6
   357
   358
359
   369
365
   370
          PRINT AT 16,C;B
IF C=26 THEN LET G=5
IF A>21 AND Q$4>"Y"
   380
  390 II
400 II
                                                  THEN GO
          IF
  403
                A>21
                          AND U)21 AND 0$="V"
  THEN GOTO 800
405 IF C=26 THEN GOTO
410 IF A<=21 OR U<=21
                          THEN GOTO
                                               420
                                              THEN GOTO
  160
415
420
423
          NEXT K
FOR Z=1 TO 2
LET 00-1
PRINT AT 20,
                D=INT (RND+13)+1
D=1 THEN GOTO 3000
D)=10 THEN GOTO 35
R=R+D
U=U-5
   425
                            20,0;"
  427
430
433
436
440
          RAND
          LET
           IF
          LET
  4450
450
470
48
          LET 5=5+8
PRINT AT 6,5;D
NEXT Z
IF R=21 OR V=21 THEN GOTO 6
88
  490
          IF.
                A$="0" THEN GOTO
R>21 AND Z$<>"Y"
                                                   700
                                  Z$ <>"Y
  500
                                                   THEN GO
  0 820
503 I
TO
  503 IF R>21 AND V>21 AND Z#="Y"
THEN GOTO 820
510 IF R>=16 AND R<=21 THEN GOT
0 620
515
          IF U>=16 AND U(=21 THEN
                                                         GOT
0 620
  5235
          FOR 0=1 TO 3
          RAND
         LET D=INT (RND*13)+1
IF D=1 THEN GOTO 3000
IF D>=10 THEN GOTO 3500
LET R=R+D
LET U=U+D
LET S=5+6
  533
  546
545
550
                5=5+6
          PRINT AT 5,5;D
IF 5=26 THEN LET E=5
GOTO 501
IF R>21 AND Z$<>"Y" THEN GO
  562
570 II
575 GI
575 GI
70 820
781 II
          IF
                R>21
                          AND USE1 AND Zam"Y"
            90T0 828
F R>21 THEN
F U>21 THEN
F 5=26 THEN
          IF
IF
  583
584
                                   LET I
                          THEN
                                            R=V
                                            V=R
  585
                                              620
  586
          IF
                U <=21 AND
                                    USA
                                            THEN
                                                     LET A
         LET H=1NT (RND #2)

IF H=1 AND R>=16 AND R<=21

GOTO 620

IF H=1 AND U>=16 AND U<=21

GOTO 620

IF R<16 AND U
=11
  587
589
  590
THEN
  595
THEN
596
610
        GOTO 620
NEXT D
  597
                       AND R<20 AND U<20 TH
EN GOTO
600 GOT
610 NEX
620 IF
                UK=21 AND USA THEN LET
```

21

hat

eith

Will

/OJ

SVE

ng.

the

wn

ad

ve

m

ve

nd

ou a

84

A>21 THEN LET A=U ĪF 526 THEN LET zŪ 628 IF R>21 THEN LET IF 830 AND 8 <>5 THEN COTO 20 635 G=5 AND E()5 THEN IF GOTO 40 IF E=5 AND 0 720 IF E=5 AND 640 E=5 AND G=5 AND R>=R THE COTO 450 G=5 AND A>R THEN 740 COTO 650 670 IF RY AR THEN GOTO ĬF 780 680 PRINT AT 10,0; "PONTOONS, BAN WINS. KER 685 LET M=M-X GOTO 840 PRINT AT 690 700 10,0, "PONTOONS, YOU WIN. GOTO 848 705 PRINT AT 710 720 10,0; "BANKER UINS HTIU OF ";R;" LET MEM-X GOTO 842 PRINT AT A FIVE CARD TRICK 125 730 740 10,0,"YOU WIN A FIVE CARD OF ",A," ET M=M+X TRICK 745 GOTO 840 PRINT AT 750 760 10,0; "BANKER WINS WITH LET M=M-X COTO 840 765 770 GOTO 840 PRINT AT 780 10,0; "YOU WIN WITH ", A; 785 LET M=M+X GOTO 840 PRINT AT 790 800 10,0; "BURST BANKER ŬĬÑS 805 LET M=M-X GOTO 840 PRINT AT 810 820 10,0, "BURST. YOU WI N. 825 LET M=H+X
840 PRINT AT 20,0; "DO YOU WISH
ANOTHER GAME? (Y/N)"
850 LET 8\$=INKEY\$
860 IF 8\$="Y" THEN GOTO 8
870 IF B\$="N" THEN GOTO 9000 GOTO 850 PRINT AT NT AT 20.0," TO CAMBLE ? M<=0 THEN PA 900 "HOW HUCH DO THAN YOU 910 IF PRINT AT "YOU HAVE NO MORE MONEY TO WITH. IF IF 915 IF M<=0 IF M<=0 INPUT X THEN PAUSE 50 920 GOTO 9000 930 940 X>M OR X <= 0 THEN ΪF GOTO 93 Ø 950 PRINT AT 1,16; "THIS GAME IS PRINT 960 AT 2,18, "FOR 2";X GOTO 320 970 IF XL=1 THEN GOTO 2000 LET XL=1 LET O\$="Y" LET A=A+B IF B=1 THEN LET U=U+11 IF B=11 THEN LET U=U+11 1000 1010 1020 B=1 THEN LET U=U+11 B=11 THEN LET U=U+11 1030 LET C=C+8
PRINT AT 16,C,"A"
IF P=1 THEN GOTO 315
IF P=2 THEN GOTO 390
LET A=A+10
LET U=U+10
LET U=U+10 1040 1050 1060 1989 1090 1500 1510 1520 LET Č=C+6 LET 1530 (RND#4)+1 Y=INT 1550 LET Y\$="10" Y=1 THEN Y = 2 THEN IF IF 鼯 1560 Y=3 THEN 1570 THEN

1580 1590 PRINT NT AT 16,C P=1 THEN G P=2 THEN G C;Y* IF ÎF 1600 2000 LET A=A+1 2010 LET ひ=ひ+1 ENT AT 15.C, "A" P=1 THEN GOTO 315 P=2 THEN GOTO 390 XB:1 THEN GOTO 390 2020 LET PRINT IF IF 2040 2050 3000 3010 3020 LET XB=1 Z\$=" LET 3030 R=R+D 3040 D=1 THEN LET U=U+11 D=11 THEN LET U=U+1 ĪF 3050 3060 LET 5=5+5 3070 NT MT 5,5,"A" DD=1 THEN GOTO DG=2 THEN GOTO PRINT 3000 IF IF 3090 570 LET 3500 R=R+10 3510 LET U=U+10 3520 3=5+6 LET 3530 Y=INT (RND #4) +1 Y=1 THEN Y=2 THEN 3540 Y\$="K" Y\$="G" Y\$="G" Y\$="G" LET 3550 3560 3570 IF IF Y=3 THEN LET IF NT AT 6.5; Y\$ 00=1 THEN GOTO 00=2 THEN GOTO PRINT 3580 3590 IF 3600 570 4000 LET R=R+1 V=V+1 4010 4020 LET 5=5+6 PRINT AT 6,5;"A"

IF QQ=1 THEN GOTO 470

IF QQ=2 THEN GOTO 570

FOR J=1 TO 50

PRINT AT 10,10;"PONTOONS"

PRINT AT 12,6;"EN ENDETE 4030 4040 4050 8699 8010 8020 5030 S030 PRINT H, 10,000 GAHBLE WIT N GIVEN 250 TO GAHBLE WIT COURTESY OF KENNETH LAW." 8050 PRINT AT 10,10,"FORTOGAB" 8060 PRINT AT 12,6;"BY KENNETH PRINT AT BEE GAHBLE WITH KENNETH NEXT 8100 8200 CLS 3300 RETURN 9000 PRINT AT 5,0; "YOU CAME OUT IE CASINO WITH £", M IF M>50 THEN PRINT , "YOU A PROFIT OF £"; (M-50) IF M=50 THEN PRINT , , , "YOU NOT LOOSE ANYTHING." IF M<50 THEN PRINT , , , "YOU E", (50-H) 9010 THE 9020 MADE 9030 "YOU DID LOST 6 9040 RATING ***************** EXPERT, A PROFESSIONAL A 3065 IF M>500 THEN GOTO 9200 9070 IF U ARE A M>150 THEN PRINT 11,"40 GOOD CONSISTANCY WITH WORKING GREY MATTER, 9075 IF M: 150 THEN GOTO 9200 H) 50 THEN PRINT LEAST YOU MELLINT 9080 IF MANAGEÓ TÓ BRE BAD AT L 9085 IF M:50 THEN GOTO 9200 9090 IF M=50 THEN PRINT , "YOU ARE NOT A GAMBLER, YOU ARE A HIS ARE 3095 IF M=50 THEN GOTO 9200 9100 IF M<50 THEN PRINT , OLUTELY PATHETIC-THAT""S YOU, TE-MAY I SUGGEST A NEW HAT YEE ONE WHICH HAS A BIG ON "ABS MA MA 9200 STOP

1100 TO BE WON PLUS MANY OTHER PRIZES
Type are skillful enough to help Snaker on his deadly mission.
To penetrate the hidden depths of the egg plantation and
desover the secret symbol which is your key to success and

Scavenging the egg plantation Snaker grows by munching multi-coloured eggs. With powerful laser venom for protection staker must battle with vicious aggrenoids, kill poisonous viproids and avoid pulsating chrystoids. Then journey through the many mazes to reach the power stones of regeneration. How far can you take Snaker on his mission?

LASER SNAKER features challenging arcade action, 100% mechine code, superb graphics, colour and sound, pregressive difficulty levels, bonus lives, high score table keyboard or Kempston Joyatick, £100 to be worthlus runners.

PULL COMPETITION DETAIL & COMPETITION WITH EACH CARRIES

£5.**95**

EE,

L

OU

OU CU

RE

TE TE

15 10

984



Dealer Enquiries Welcome

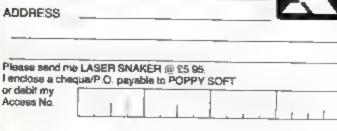
illRoad, Headley, N

l enclose a chequa/P.O. payable to POPPY SOFT or dabit my

Access No.

NAME . ADDRESS

Signature



Skittle

A game of skill and judgement from Andrew Cook of Wigan.

This game for the Spectrum was written for my younger daughters who have difficulty manipulating four or five keys at once which in most games I have come across is usually an absolute minimum

When the game is first RUN a bowing a lev is printed up on the screen with skittles shown at the far end. An arrow traverses at the start of the alley and you have to use your judgement as to when to stop the arrow. Of course if you're starting off it is best to get the arrow I ned up with the centre

the arrow, using the 'Z key, you see the bowing ball roll down the alley knocking down a or a few of the skittes Should you not have knocked down a the skittles you will get a second attempt to knock down the remaining skittles Once you have done this you will be presented with the second frame there are 10 frames in a

The game is very suitable for children because although

it is easy to play it does require a fair amount of color dination to stop the arrow in the best place to hit the skit I es

Line by line

To help you get the most of the program here to lows a brill breakdown of the listing

Lines 14 70 Lines 540 600

Lines 7-13

Lines 620 800

Lines 920-1020 Lines 2000-2050

Lines 4000 4055

Lines 5040-5120

Select the eve of difficulty of the game, how fast the arrow moves across the sta of the bowing a ley. There are three evel the first being the easiest. The speed of the moving arrow is determined by the ength of the BEEP in line 200

Print the bowing alley

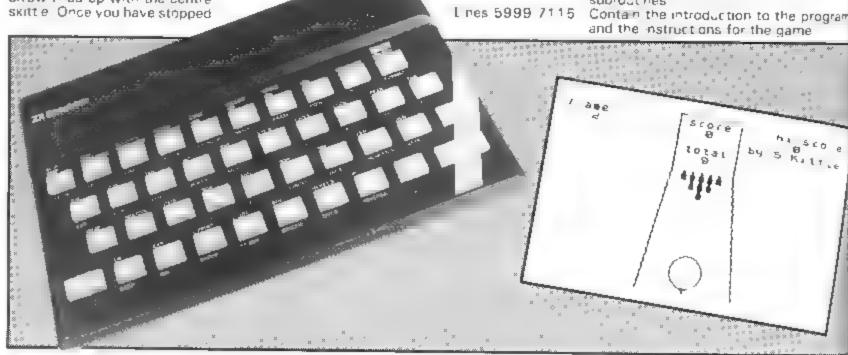
Print the skittles at the end of the bowling

Contain the 'ball drawing' subroutine Thi s achieved by successively drawing ordi of dimin shing radii on the same centre The centre of the cardle la, is determined by where the moving arrow stops

Set the user defined graphics Contain the loop used to move the arrow to aim the bowling ball

These lines print the various combination of skittles lying down depending on where the bowling ball hit them

Contain the 'score and high score subroutines Contain the introduction to the program



REM **** SKITTLES * * * * A.COOK PAPER **** BURDER 5 INK intro=6000 GO SUB intro 4 CLEAR 5 RESTORE LET hi=0 LET as "S.Kittle 7 PRINT AT 10,5, "Enter tevet difficulty", AT 12,5, 1 Easy", 17,5, "2 Harder", AT 14,5, "3 di 47 fracuit LET ds-INKEYS IF CODE ds (4 CODE ds) 51 THEN GO TO 7 10 LET E d\$>51 THEN GO d\$="1" THEN LET OR IF 11 beep . 0 a 12 IF d\$="2" THEN LET beep=. 01 25 d#="3" THEN LET 13 IF. 24 883 FLOT 33,8 DRAW 15,11 15 PLOT 176,0 DRAW -16,112 104,112: 16 PLOT DRAU 0,50 20 PLOT DRAW 0,50 DR -58,0 29 LET total=@ LET count = 1 30 LET ítag=Ø. LET score=ø.

flaga=0 LET flagb=0 C =0 LET flagd=0 LET LET chr=920 Path=3000 L 1 # = 2000 LET to a to 4000 LET PRINT AT 2,14, IN 2,14, 35 TNK 3, "score 3,15,score PRINT AT 5 5,16,total PRINT AT 2 AT 37 5,14, INK 3, "total ", ĀT 38 2,0, INK 3, "frame 15 40 3,3, INK S 3, count 50 PRINT PRINT AT 3,25, 60 70 3\$ รืออ 520 RESTORE GO SUB chr FOR b=14 T PRINT INK 14 TO 18 INK 0, AT 540 560 PRINT 8, b; "A": NE ь 580 FOR 6=15 TO 17: PRINT INK! AT 9,5,"A": NEXT 5 500 PRINT INK 0,AT 10,16;"A" 610 IF flag=2 THEN GO TO COUNT! 615 GO 5UB alm

INK 1,a,20,15 OVER 1;a,20,15 INK 1,a,40,12 OVER 1,a,40,12 INK 1,a,60,9 OVER 1,a,60,9 INK 1,a,60,6 OVER 1,a,60,6 OVER 1,a,80,6 OVER 1,a,80,6 OVER 1,a,80,6 INK 1,a,100,3 OVER 1,a,100,3 CIRCLE 640 CIRCLE 660 t of the 680 CIRCLE a brief 700 CIRCLE CIRCLE CIRCLE CIRCLE ame ie 160 780 e start - 90 CIRCLE levers GO SUB hit *55 IF SCORE +9 AND flag=1 THEN PINT FLASH 1, AT 3, 16; "9" BEEP 1,3 GO TO COUNTER (57 IF a=131 AND flag=2 THEN BE P .5,5 GO TO COUNTER (860 PRINT AT 3, 16, INK 3, score 870 PRINT AT 6, 16, INK 3; total 880 PRUSE 100 wling Ths circles IF a=131 THEN GO TO 30 +10 915 STOP 918 REM graphic itions 940 FOR 5=0 FOR s=0 TO TO / F READ X POKE S REM graphic 960 FOR S=0 TO 7. READ X: POKE SR "c"+S,X NEXT S: REM graphic 980 DATA 24,24,24,50,50,50,60,6 1000 DATA 0,0,0,0,0,1,255,255,31 1020 DATA 0,0,0,0,248,255,255,24 1840 RETURN 1860 STOP 1399 REM **** 318 **** 2000 FOR x=14 TO 13 PRINT AT 21 ... INK 0," +". BEEP 5000 IF INKEY =="Z" THEN GO TO 2050 2005 NEXT X 2010 FOR x=18 TO 14 STEP -1: PRI (AT 21,x, INK 0,"+ " IF INKEY 1"Z" THEN GO TO 2050 -015 NEXT × 1020 GO TO alm -050 FOR p-13 TO 19: IF SCREEN\$ 21,p)="+" THEN GO SUB path ≥055 NEXT p 9060 RETURN 1999 1000 a=114 a=124 THEN LET 1005 IF P=14 P-15 IF THEN LET 3010 3020 IF p=16 THEN LET 3030 IF p=17 THEN LET 3040 IF p=18 THEN LET -045 IF p=19 THEN LET a=131 a=139 a=147 a=147 050 RETURN 999 REM ******hit***** INK 0; A 000 IF a=114 THEN PRINT INK 0;A 8,14,"B",AT 8,15,"B" IF flaga 8 AND flagb=0 THEN LET score=2 4000 LET flaga=1 L re GO TO 4055 LET total=total+sc Tre GO TO 4055

4010 IF a=124 THEN PRINT INK 0; A

1 8,14, "B", AT 8,15, "B", AT 8,16,"

1, AT 9,15, "C" IF flagb=0 THEN

ET score=4 LET flagb=1: LET to

tal=total+score GO TO 4055

4030 IF a=131 THEN PRINT INK 0; A

8,14, "B", AT 8,15, "B"; AT 8,16,"

, AT 8,17, "C", AT 8,18, "B", AT 9,

15, "C", AT 9,16, "C", AT 9,17, "C"; A

1 10,16, "B": LET score=9-score:

FT total=total+score: GO TO 405 *040 IF a=139 THEN PRINT INK 0; A 1 8,15, "B", AT 8,16, "C", AT 8,17, " 2', AT 8,18, "B"; AT 9,17; "C": IF f agc=0 THEN LET score=4: LET fla LET total=total+score. GO

3

d of

he

tre

med

rrow

here

am

9

t =

€ 3

at

-S C

EX

te

1984

91

10 4055 1050 IF a=147 THEN PRINT INK 0; A 1 8,17, "C", AT 8,18, "B" IF flagd =0 AND flage=0 THEN LET score=2 LET flagd=1 LET total=total+sc 4055 LET flag=flag+1 4050 RETURN 4999 REM **** counter **** .000 PAUSE 50
.010 LET count = count + 1
5015 PRINT AT 3,3, count
.020 IF count = 11 THEN GO TO 5040
.030 GD TO 30
.040 CLS PRINT AT 10,10, FLASH
.1. INK 1,"score = ", total
.042 IF total < 20 THEN PRINT AT 1
.10, INK 1, FLASH 1, "KEEP TRYIN 2000 PAUSE 50 → NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ NEEP TRYIÑ

→ 1047 IF total;39 AND total 60 TH N PRINT AT 12,10, INK 1; FLASH I "GOOD"

5050 IF total)59 AND total(75 TH N PRINT AT 12,10, INK 1; FLASH

I "UERY GOOD"

052 IF total)74 AND total(90 TH N PRINT AT 12,10, INK 1, FLASH

I "EXCELLENT"

1053 IF total=90 THEN PRINT AT 1

1,10, INK 1, FLASH 1, "FANTASTIC"

055 PRUSE 200 10, INK 1, F 5050 PHUSE 200

5060 CLS PRINT AT 10,2,"Do you wish to continue(y/n)"

670 IF INKEY\$(>"y" THEN IF INKE \$(>"Y" THEN IF INKEY\$(>"n" THEN IF INKEY\$(>"n" THEN IF INKEY\$(>"N" THEN GO TO 5070

650 PAUSE 0 IF INKEY\$="y" OR INKEY\$="Y" THEN GO TO 5090

5085 CLS FOR e=1 TO 130 PRINT INK RND*6," Bye ", NEXT e 100 TO 5100
100 IF total > h1 THEN LET h1 = tot
11 GO TO 5100
100 GLS PRINT AT 5,0, "Well do
12 you have beaten the" '" high s
12 you have beaten the" '" (8 tetter
13 Max.) and press enter"
110 INPUT as
120 GO TO 10
149 PFM **** into **** 7399 REM **** intro ****
5000 CLS PRINT INK 2; FLASH 1,
TT 10,11, "SKITTLES"
7000 LET a=.2 LET b=.4
7010 BEEP a,5: BEEP a,3: BEEP b, 7020 BEEP 5,1 BEEP a,1: BEEP a, 7020 BEEP 5,1 BEEP a,1: BEEP a,
7030 BEEP a,6 BEEP b,8: BEEP b,
8EEP a,8 BEEP a,5
'040 CL5 : PRINT AT 10,3;"Do you
require instructions?";AT 11,15
,"(y/n)" /"(y/n)"

/050 LET a\$=INKEY\$

/060 IF a\$<>"y" THEN IF a\$<>"Y"

(HEN IF a\$<>"n" THEN IF a\$<>"N"

(HEN GO TO 7050

/070 IF a\$="y" OR a\$="Y" THEN GO TO 7090 2080 GO TO 7090 CLS PRINT AT 8,0;"You bow 7090 CLS PRINT AT 8,0;"You bow thice in each frame" "Unless y no clear first time." PRINT PRINT "Each game consists of 10 frames." PRINT 7100 PRINT AT 20,0; FLASH 1,"PRE 55 ANY LETTER" 7110 IF INKEY\$="" THEN GO TO 711 7115 GO TO 5

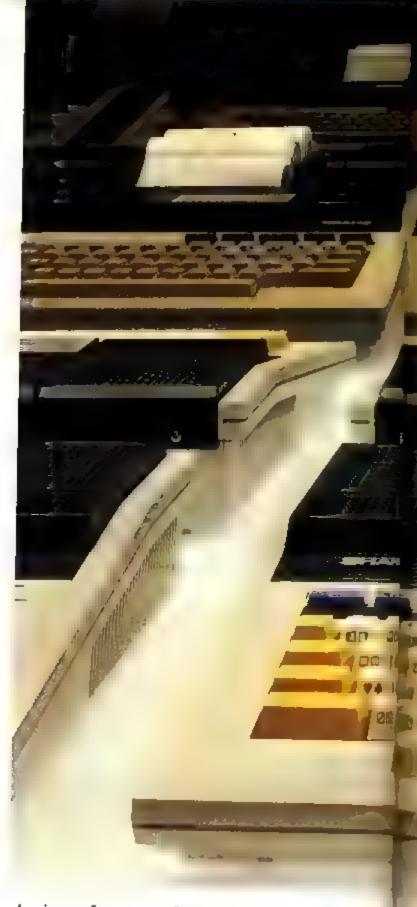
Now, a home computer with virtually no limit to its possibilities. The astonishing new Sharp MZ700. A machine with a dazzling array of talents.

First, it's a 'clean' machine. So you are not limited to any one computer language. You have the flexibility to run and write programs in BASIC, FORTRAN, MACHINE CODE, PASCAL, ASSEMBLER and many others. And the MZ700's 512 predefined characters mean you can build up detailed pictures on the screen, without spending time specifying and designing special characters for games and special effects.

Second, it has a memory of 64K. So as your technique improves and develops, you are able to move forward to more and more advanced programming.

All of which makes this the perfect home computer for parents, as well as children.

The MZ700 gives you access to a wide



choice of new software, from only £3.95 CP. per cassette. An additional plotter/printer ROI costing £129-95, can produce high result tion graphics in 4 colours. A data cassett RAN recorder is an extra at £39.95. Both add ons fit snugly into this easy to carry comp system with no trailing wires. And you get ten exciting games, free on purchase including Super Puckman, Circus Star, Snake v. Snake, and Man-Hunt.

RGE

The brilliant new MZ700. The no-limit computer, £249-95. From Sharp. Where great ideas come to life.



Monitor 4K byte ROM 1
Character generator 4K byte ROM 1
Character generator 4K byte ROM 1

AM 64K byte D RAM 8
4K byte V RAM 2

Who bus Expansion 1/0 bus 1
Additional printer 1/0 bus 1
Cassette READ/WRiTE terminals 2
Joystick terminals 2

MON TOR/VIDEO MONITOR/RE OUTPUTS



solu-

ette

dd-

se,

pact

Look for this logo on software denoting Sharp Compatible Software.

To Sharp Electronics (UK) Ltd, Home Computer Division, Sharp House, Thorp Road, Newton Heath Manchester M10 9BE, Tel 061 205 2333

Please send me details of the Sharp MZ 700.

Name

Address

The world of

where great ideas come to life.



PICOBEM BCCE

Peter Shaw, programming supremo, answers your questions and offers advice on your computing techniques.

Dear Peter.

I am having an increasingly an noying problem with my 2X Spectrum computer. Having to change plugs when loading and saving is not only tiresome, but is making the plugs loose and unreliable. I have heard that it is possible to put some kind of resistor in the computer so that both plugs can be left in at the same time. Do you know of this method, and if so could you enlighten me a little.

Steve Kau Welling Kent

Steve

You are right, it is possible to use a resistor to achieve what you want. You will need a 330 \Omega resistor between the signal and earth leads of the EAR plug. As the jack supplied with the Spectrum is movided you will need to either buy another lead or another jack, I you do the latter, solder the resistor across the contacts when you connect it. You can get more information from the shop where you buy the resistor.

Dear Peter,

have my Spectrum linked up to a colour television via a VCR. At the computer club liattend have been told that could send a composite signal directly into the recorder, and so get a better picture is this true? And if so could you give me the details as to what is required.

Danie Eliot Ashford, Middlesex

Daniel, It is possible to send a composite signal directly into your VCR by Jumping the modulator What you will need is

Two metres of co-axial wire
Two male BNC connecting
plugs
One female panel mounting
BNC plug

A few short lengths of coated

Open your Spectrum and find the modulator it is the silver box in the top left hand corner as you open it. There should be two wires coming out of the box on the left hand side. Solder a short length of wire to this being careful not to touch the circuit board or chips with the soldering iron Solder another length of wire directly onto the metal box itself. Then, connect the two wires which you have just soldered to the female BNC plug. Make a hole next to your ordinary TV output and fix the panel-plug in the hole. Connect. the two male BNC plugs together via the co-axiai cable Plug one end into the 'VIDEO OUT socket of your VCR and the other end into the BNC plug on your Spectrum Select the video channel on your TV and press the AUX button on your VCR You should (because it worked with mine!) see the Spectrum copyright logo (that is if your Spectrum is turned only

Dear Peter,
wish to use by Spectrum as a word processor. Can you suggest the necessary hardware software will need to do this

Sophie Gumpel London NW6 Soobie

The software side is easy Tasword Two is, in my opinion, really the only word processor you need look at Luse it quite extensively and have had no problems at all. The hardware side is a little more difficult—the first job is to get the necessary interface for your Spectrum fone of the better ones is the Kempston Centronics Interface but there are others on the market) The type of printer is the next step I would suggest something that is within your budget, works with your interface and has the presentation you require. At the bottom end of the market are the cheap dot matrix type printers which are quite

fast and cheap, but are not really all the good for sending letters to the bank manager A little more expensive are the daisywheek which have excellent quality But what you gain in quality you lose in speed the average purting speed of a daisy wheel s about 13 cps (characters per se cond. At the top end of the market you can get fine dolmatrix printers and daisywheels which not only have high quality printout but also are fast these are usually expensive though

Dear Peter This summer holiday when went to Geneva, I bought i



Sincial Spectrum 16K I thied to load the introductory side a and side bibut the computer always replied with a 'R Tape loading error imessage and I could not save any programs have also thied saving and loading with only two leads at ached. However, this did not work either. Can you help with his problem.

Maung M a Panchshe a Pk New Deihi india

eally

rs to

nore

reels

ality

YOU

prin-

er 15

rse the

dot

eeis

autv

sive

er I

ht a

This is a classic problem among Sinciair computer owners ever since Sinclair Research brought out the Mark 14 there has been the 'Sinciair saving' syndrame Although Sinciair Research improved the chances of loading with the Spectrum, there are still a few quirks you could try such as only using two owgs at a time, keeping the cass ette recorder well away from the V or any other electrical appliance which might cause interference like the radio, etc., using quality short length, computer tapes, and lastly, keeping your lingers crossed!

Dear Peter have owned a ZX81 computer with 16K RAM pack for three months now and a month ago started getting loading problems where harfway through the program the machine suddenly stopped loading and the cursor refused to appear in other cases, the cursor appeared except that it was an Linstead of a K. The LOAD and SAVE works tine without the RAMpack Could you tell me the solution to a limy problems?

Nicholas McLean, Dunbartonshire, Scotland

This could be a case of 'RAM Pack Wobble' as it s known in the trade If so, keep your comouter on a firm flat base at all imes, and try not to make any sudden movements at the keyboard If 'RPW' is not the problem then I would suspect that there is something wrong with one of the chips in your RAM pack As this chip's filled with information during loading. s cannot accept it and the computer goes ito crash mode. If you think this might be the reason behind your lack of loading success, send the RAM pack back to be replaced

Dear Peter have had a 48K Spectum for about six weeks now and I have to say that it is a fantastic little machine. The only thing that mark my enjoyment is the sound, but I am hoping to correct that by adding the Fuller Master Unit shortly. However, that is not why lam putting pento paper.

I'm earning BASIC pretty well and I have learned to put a program together to build up a TV picture and then save the resulting TV screens on the end of an existing program to give a nice display while loading like the commercial software. And like the commercial software have printed the usual 'Press any Key to Begin' but unlike the commercia software mine does not work! The only way . can run the main program sito break into the screens program and then press RUN as norma-My problem is once the iscrens. program is run and saved it no longer seems to recognise any other mes, le IF NKEY\$ etc. So, if you could help me to runthe main program after the program and screens program have been loaded, I d be much obliged

Bryn Cheadle Cifton, Manchester May I first say what an excellent choice of sound units you have made, I think the Fuller range definitely to be the best. To deal with your problem, I first of all trust that your screen is in fact, a saved SCREEN\$, le the picture is saved as SAVE 'name' SCREEN\$ If not, then read Chapter 20 (page 105 of edition 3) of your manual. Most commerciai software incorporate what is called a 'loader' that is, a program which is only used to load and run the software. First of all write a loader similar to this one.

10 REM ZX Computing loader 20 LOAD "ZX" SCREEN\$ 30 PRINT AT 21 O., 40 LOAD "Computing"

Your SCREEN\$ should have the file name "ZX" and saved directly after the loader. Your main program should start off.

10 REM MAIN PROGRAM 20 PRINT AT 21 0,' PRESS ANY KEY TO BEGIN' 30 IF INKEY\$ "'THEN GOTO 30 40 REM REST OF PROGRAM

And should be saved in the following way

SAVE "Computing" LINE 10

Remember not to include the 'Press any key to begin' business in the saved SCREEN\$

this is printed on the bottom line at the start of the main program. Also, remember that as there will be things printed on the bottom line of the screen don't include any of the picture in that area.

Dear Peter

We are writing to inform you of a cure for the Spectrum ibuzz' and also its lattendant overheating problem as brought to your attention by Christopher Hooby in the buly ibune issue of ZX Computation.

We are marketing the 'P R Adaptor' for both the Spectrum and ZX81 at a cost of £8.95 n cluding P&P. This unit simply plugs in place with no so dering or dismantling necessary and is an effective cure for both the buzz and overheating.

The unit slava able from the address below by mall order or from the retail outlet. Modern Electronics. Market Road. Don cester.

Yours, Riol Lane Pile Electronics, 14 Bretby Close, Doncaster Silvers DN4 6EL

Mr Lane,

Thank you for that piece of information, I think you have chosen the right product. To all our readers who think that their machine is really for frying eggs on or scaring away the crows, watch ZX Computing for a full review of this product in the near future.

To all of you who wish to start your computer club, please remember thit you can get one of the Staines and Stanwell Computer Club's information sheets on starting your own club by sending an SAE to

Computer Club Info Sheet, c.o Problem Page, ZX Computing, 145 Charing Cross Road London WC2 OEE

I you are sending your SAE with a problem please mark the SAE COMPUTER CLUB NFO SHEET, to save any confusion



LEYBOARD FOR USE WITH TX 81 SPECTRUM IA-64 MEMONT I III IX ECTRUM Memory MICE THE PARTY. £19.9 YOUR GRAS Joystick and Interface for Sinciair Spectra The interface supplied we the quick short TM has in facilities for two Joysticks:

SPANISH MODEL



IN CB11 2AC. Telephone: (0799) 26350 (24 hrs) 5 lines

INTERFACE AND ONE JOYSTICK

WINNING IS WITHI

with these features to give yo endless hours of enjoyme

Super positive response fire button 2 Firm suction cupili stable one hand operator

Snug fit hand moulded gri 4 Additional fire button 5 Extra long 4% lea

be connege

The first port simulates of & O keys The second por simulates in 3.1 command It will run any Softwar I Using keys 6, 7 ET

and! 2 Having redifinable to LIUUXKIII

3 Using in (31) Le Kempsion 4 Any Software you we

SPECTRA-SOUN

Hill Brand

€9.75

The TONNECTO

£10.00

Discussion when the second of	ase desuggly and birds while Juden
Please send me	ψ± €
Please sendime	ne E
Please send the Please add on £ 25 for post and packing chiclose cheque/P O payable to DK Tronics total £	¢r €
Of debit by Access/Barciaycard No	

Signature Name Address

Send to: DK Tronics Ltd., Linit 6, Shire Hill Ind. Est., Saffron Walden. Essex CB11 3AQ. Telephone: (0799) 26350 (24 hrs) 5 lines



E19.

compt compt e numb re H ro ely I ror ower a

myade there, an idea te hold te, 4K

9 J

SP etrum ve you ment uttorn ips for ration d grip uttorn

t lead d with las the licks to ected a 6789 d port mand ware 7 8 9 and 6 le key

write Jeser the La brough

OSTOP

D Oį

derit iç

Christmas card

All the season's greetings from Clyde Bish of Exeter.

Have you thought of sending someone a cassette-based Christmas card this year? If you have, you may like to have a look at one I will be sending to someone this year! The program makes use of the Spectrum's high resolution graphics and user defined graphics. You'll also find that colour and the much-makened BEEP function have been extensively uti-

Paging Santa

There are four 'pages' to this card - these start at lines 3, 50, 200 and 399 in Program 2

The first screen gives a seasonal greeting in large etters (courtesy of Uncle Sir Clive's Horizon tape) whilst the PAPER colour scrolls, A line of bells then appears between the message, and rings out a Christmas chime

The program then takes on a more serious note as the screen changes to show the stable at Bethlehem, with a starry sky above The song 'O Little Town Of Bethiehem' can be heard while the stars above twinkle. The interior of the stable can be seen to brighten as the birth of baby Jesus takes place, and the Star of Bethle hem appears over the stable. Star beams appear to reach down from the star and shimmer as the computer aunches into a rendition of 'Away In A Manger

The third screen shows a Christmas tree with candles and a star nestled within its branches. The candles are then lit and the star begins flashing, and 'We Wish You A Happy Christmas' is played. Following a series of messages in which you are invited to guess who is about to come on-screen, complete with reindeer and sleigh comes Senta with messages of peace and goodwill

The final screen gives the message 'God Bless' bordered by holly eaves and berries, to the accompaniment of the hymn 'Silent Night'

Greetings . . .

To use the program, first load the "walls" program from the Horizons tape, then enter NEW. Don't worry, you only want the

machine code routine - and that's safe above RAMtop. Now, type in Program 1, RUN it and enter the numbers in Fig. 1, reading across the lines. Enter NEW again, and type in Program 2.

Here are some notes to help you type in the program:

1. The capital letters within the quotes in lines 38, 55, 80. 200, 260, and at the beginning of line 305, are the userdefined graphics and should be entered in graphics mode.

2 - In line 400, the variables, x\$ and y\$, have to be entered using colour control characters Type in LET x\$-" (followed by the following sequence of key presses — don't enter the '/' characters as these have only been included to space the different key presses!"

"E Mode Caps Shift 4/Gra-phics Mode I/E Mode Caps Shift 2/ Graphics Mode J/E Mode Caps Shift 4/Graphics Mode H/E Mode Caps Shift

Similarly, after LET y\$-". use the above sequence substitute Graphics Mode H for Graphics Mode I, and Graphics Mode I for Graphics Mode H.

3 - Line 450 goes to itself to prevent an error message You appearing - could replace this with STOP, or RUN if you wanted the program to keep repeating.

To save the program on tape, use the command

SAVE "xmas" LINE", SAVE "xg" CODE USR "a", 168 SAVE "xc" CODE 32256, 300

When loaded, the program autoruns, firstly loading in the user-defined graphics bytes and the machine code before starting the display.

As written the program occupies almost all of the available space in a 16K Spectrum and the program takes about three and a half minutes to

If you don't like the messages or prefer other tunes in the program, then change them! I have made the program as general as possible, but if you want to change the messages to make them more

personal, then just remember you can only have eight letter maximum for each word. Happy Christmas, every

Fig. 1

142 254 255

248 248 252 252

125 126 62 33

255 126

255 125 69

124

252 208 240 63 62 18 11

5.3

11 15 62

72 68 66 112

64 64 64

255 255 63 15 3

31 63 127 255

224 240 248 252 254 255

2 6 囟 54 32 64

3 255 127 53 31

2 4

128 192 254 252 248

31 63 127 255 3 3

248 252 254 255 192 192 128 128

Program 1

10 FOR n=0 TO 167: INPUT i P INT i: POKE USR "a"+n,i: NEXT n

Program 2

1 BRIGHT 0: GO TO 3 2 CLEAR 32255. LOAD " a". LOAD ""CODE 32256 ""CODE US DURDER S PAPER S.

LET P\$ "Season's"

LET P\$ "Season's"

LET P\$ = "Greeting"

GO SUB 3000

S PAUSE 50

3 FOR D 1 TO 33 FOR D-1 TO 5 33 FOR N -1 TO 5 FOR 1 = 0 TO 21 PRINT AT 1,0; OVER 1; PAPER N,

NEXT 1 NEXT n

34 PAUSE 50 DUER 37 PRINT 91 10,2, DUER 0 INK 6; " 33 FOR 1, 1 TO G PRINT RT 11, 2 PAPER S, INK 1, "F, INK 2; "G INK 1, "F, INK 2; "G "; INK 1;" INK 2, "G ", INK 1;" F "; INK 2, "G ", INK 1;" F "; INK 2, "G ", INK 1;" F "; INK 2, "G ", INK 1;" G ", INK INK 2, "F ", INK 2, "F ", INK 2, "F ", INK 2, "F ", RERO a, b, BEEP a, b NEXT D 40 DATA 1,4,1,0,1,2,1,-5,1,4,1 0,1,2,1,2,-5..2,12,.2,11,.2,9,. 45 PAUSE 50 50 BURCER 4 PAPER 1 CLS IN SØ BURCER 4 PHPER 1 CLS IN 55 PRINT AT 19,14."N 0"; AT 21,14," 1, AT 20,15; INK 6," 1, AT 21,14;" 1, AT 21,14;" 1, AT 21,15; INK 6," 1, AT 21,17; IN 20 60 FOR n = 1 TO 50 ND ± 140 + 32 NEXT n PLOT RND #255 PMD ± 140 +32 62 PAUSE 20
65 RESTORE 70: FOR n=1 TO 17.
8EAD a,b 6EEP a,b. NEXT n
70 DATA .75,2..75,7..75,7..75,
375,12..375,11..375,9..375,11,
375,7..75,9..75,11,.75,12,.375
,11..375,7..75,9..75,9,2,7
75 PRINT AT 20,15: INK 5, BRIGHT 1; PAUSE 4
8 PRINT AT 20,15: INK 7; PAUSE 4
8 PRINT AT 20,15: INK 7; PAUSE 4
1,15, PAUSE 40. PRINT AT 20,15, INK 7; BRIGHT 1; PRINT AT 20,15, INK 6 BRIGHT 1; PRINT AT 20,15, INK 6 BRIGHT 1 PRINT AT 20,15, INK 6 BRIGHT 1 PRINT AT 20,15, INK 6 BRIGHT 1 PRINT AT 30,15, INK 6 BR 62 PAUSE 20 READ a,b PLOT a,b READ a,b; DR AV a,b NEXT N 90 DATA 127,157,0,-133,125,156 -6,-133,129,158,6,-133,123,159,12,-136,131,159,12,-135,121,160 -18,-180,133,160,18,-160,119,161,-24,-161,135,161,24,-161,117,107,-32,-167,137,167,32,-167 95 LET c=.7. LET d=.35. RESTOR 100 GO SUB 2900; RESTOR 100 GO SUB 2900; RESTOR 100 DATA c.0,c,5,c,5,d,7,d,9,c,5,c,5,d,9,d,10,c,12,c,12,c,14,1.4,10 4,10 110 DATA d,7,d,9,c,10,c,10,c,12,c,5,1.4 120 DATA d,7,d,9,c,10,c,10,c,12,c,9,c,9,d,5,d,9,c,7,c,2,c,4,1.5 200 LET 2-0 PAUSE 25. BRIGHT 0 BORDER 3. PAPER 3 CL5: INK 4 210 PRINT AT 6,15, "ND"; AT 7,14; N 0', AT 8.14; "N 0": AT 9,13, "N 0". AT 10,13, "N 0": AT 11,1 N 0"; AT 12,12; "N 0" AT 13,11, "N 0", AT 14.11; N 0", AT 15,10; "N 0", AT 16.10; "N 0", AT 16.10, "N 0", AT 18,15; NK 5, " 12,14, " 13,14; " 14,14; " PAUSE 25. INP. 220 FOR 1-1 TO 2. FOR N=1 TO 8: READ 3.5 PRINT RT 3.5; INK 7; (1 RND 1 2 3 () RAD 1=1). NEXT 230 DATA / 13,9,12,11,11,13,10, 15,9,17,8,7.18,9,19,11,20,13,21, 15 92,17.23

NEXT D 250 DATA 8,15,10,16,11,14,13,13 .13,16,14,18,15,15,16,12,16,17,1 6,19
260 PAUSE 100: INK 6: PRINT AT 5,13; "R"; AT 6,18; "P"; AT 8,12; "R", AT 8,19, "P"; AT 10,11; "R"; AT 10,24; "P"; AT 14,9; "R"; AT 14,22; "P"; AT 14,9; "R"; AT 14,22; "P"; AT 16,8,"R"; AT 16,23,"P"
270 PRINT AT 7,15; PAPER 4; "R"; AT 9:15, "R"; AT 10,11; "R"; AT 12,13,"R"; AT 12,16; "R", AT 13,16; "R"; AT 14.15; "R", AT 15,12; "R"; AT 15,17, "R"; AT 15,19; "R"
230 FOR n=1 TO 5. GO SUB 2800: NEXT n NEXT D 285 LET 301 INK 7 PRINT AT 1,7; "GUESS UHO'S COMING?". PAUSE 100: PRINT AT 1,7; "HERE'S A "; FLASH 1; "C LUE"; FLASH 0;"......": PAUSE 0 0: PRINT AT 1,7; "PAUSE 50. FOR n=0 TO 30 STEP 3. PRINT AT 1,n, INVERSE 1; "HO" PAUSE 10. NEXT n 302 PAUSE 20 302 PAUSE 20 305 LET ME-"DEDEDEDEREC VERY MERRY CHRISTMAS AND A HAPP Y NEW YEAR TO YOU ALL" 310 FOR J=1 TO 3 FOR N=1 TO LE N M\$+33 PRINT AT 1,0, INVERSE (1/2-INT (1/2)); PAPER 1; INK 7; ("十時事十" ") (n TO_n+31). GO 5UB 280 NEXT N NEXT 25: BÖRDER 7: PAPER 7 399 PAUSE CLS INK 1 400 PAUSE 50 LET X\$="IJH": LET Y\$="HJI" FOR N=1 TO 8: READ a. PRINT AT 0,a,x\$. HEXT N: RESTOR 410 FOR N=1 TO 8. READ a: PRINT AT 21,2,7\$. NEXT N 410 COTT 2: \$ 5 12,17.21,25,29 420 LET 44-52 LET P\$="B\]
508 3000 LET 44-88: LET P\$="B\]
55" 60 SUB 3000 MT 55" GD SUB 3000 430 PAUSE S0. RESTORE 440: FOR -1 TO 46 READ a,b. BEEP a,b: N 255" n-1 TO 46 EXT N A-1 TO 46 REHD a, b. BEEP a, b: N

EXT N

440 DATH 1.2,7,.4,9,.8,7,2.4,4,

1.2,7..4,9,.8,7,2.4,4,1.6,14,.8,

14,2.4,11.1.6,12,.4,11,.8,9,1.2,1

2,.4,11,.8,9,1.2,7,.4,9,.8,7,2.4

4,1.6,14,.8,14,1.2,17,.4,14,.8,

11,2.4,12,2.4,16,1.2,12,.4,7..8,

4,1.2,7,.4,5,.8,2,4,0

2300 LET e (e 0). PRINT AT 4,18;

PAPER 3, INK 6+(1 AND e=0); "05"

PAPER 3, INK 6+(1 AND e=0); "05"

2900 FOR n=1 TO 13, READ a, b: BE

EP a, b NEXT n RETURN

2900 FOR n=1 TO 13, READ a, b: BE

EP a, b NEXT n RETURN

3000 LET xx=(256 8*xs*LEN p\$)/2

3010 LET i=23306 POKE i,xx: POKE

i+1,yy. POKE :+2,xs: POKE i+3,

ys POKE :+1,8 LET :=: f4. LET w

*LEN p\$: FOR n=1 TO w: POKE :+0,

CODE p\$(n) NEXT n POKE :+0+1,2

55. LET w USR 32256 RETURN

8

9

IN

=2 30

10

21

ber ters

ery-

"ADVENTURES IC

AVAILABLE FROM W.H. H., ...
AND ALL LEADING

Transylvanian Towis

Aspine chilling adventure...
enter via the dungeons...
navigate your way through
500 3-D rooms... survive
the swooping vampire bats
...reach the terrifying top...
confront and kill Count
Kreepie, ridding the world
of this Transylvanian Terror.
Can you survive the Top of
the Tower? Full save routine
for use during the hours of
darkness! 48K Spectrum
£6.50



Super Spy

Locate the secret island hideaway of the mysterious meglomaniac Dr. Death. Follow his trail across continents, through complex puzzles and 3-D mazes. Discover the entrance to his underground lair — but beware even with your death-defying gadgets his evil henchmen may still win the day!

With save routine for part time sécret agents! 48K Spectrum £6,50





DEALERS — GENEROUS DISCOUNTS AVAILABLE (FT)

RICHARD SHEPHERD SOFTWARE

家師 HOUSE, 23-25 ELMSHOTT LANE, CIPPENHAM, SLOUGH, BERKSHIRE.

PORÉSII

CREEH GITE

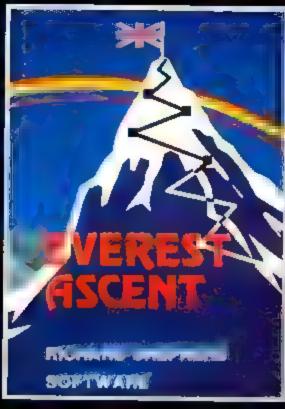
IND IMAGINATION"

. SMIJOHN MENZIES, BOOTS*

ADINCHUTER STORES







irovincible Island by Peter Cooke

Exhaust your ingenuity in the quest to find The Sevenil Parchments of Xaro and their meaning! Will they lead you to undreamt of treasures or eternal doom? Explore the mysteries of the stockade and puzzle within the Pagoda! A spectacular split screen graphic and text adventure to braintease you for weeks!

Adventurous graphics for every location. Save routine: 48K Spectrum £6.50.

Evernet Ascent

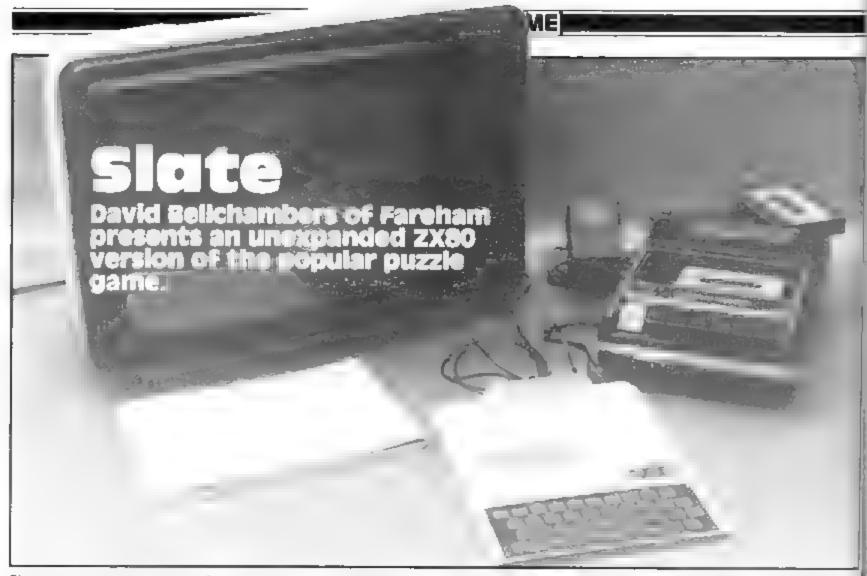
Stake your claim to the top of the world in this strategic vertical adventure. Conquer the summit of the world's highest peak! . . . struggle from base camp to base camp ... survive the elements . . . watch out for avalanches, thin ice and wayward sherpas . . . encounter abominable snowmen and cross bottomiess crevasses! A game of skill, strategy arid planning — a graphic simulation of man's ultimate endeavour! Save routine. 48K Spectrum **£6.50**.

CONFIOHN SALTHOUSE ON (06286) 63531 FOR DETAILS

EDITICAMINE HNG (04:491 HR EXPRIMICE

RICHARD SHEPHERD SOFTWARE

FLM HOUSE, 23-25 FLMSHOTT LANE, CIPPENHAM, SLOUGH INDIMESSIONE



Slate is a computer version of that once popular puzzle in which you had to move if teen tiles around in a four by four matrix unto they were align the correct order. One of the postions in the matrix is not oc cupied by a tile, and this space is used to move the tiles by sliding any one of the four adacent tiles into this space. This produces another space where the the used to be

When run, the program displays a grd of randomy mixed letters A' to 'O, but jumbled up. One of the local tions contains a space. To move a tile into this space, smpy enter the letter you wish to move to the prompt WHICH LETTER? This piece will then be moved. To complete the puzzle the top line must read 'ABCD', the second ine must read FFGH' the third ine must read IJK. and the bottom line must read MNO' with the space in the bottom right-hand corner. The computer checks to see if you have finished after every

move and keeps track of you current score and also the high score. The idea is to complete the puzzle in the leasinumber of moves. If you try to move a piece that is not on the board of you type. If for instance, you will forfet the game. The only other possible way of cheating is if you try to move a letter that is not dieply adjacent to the space at right angles.

Line by line

Here follows a brief descriptor of the program functions line by the

1 RANDOM SE 2 LET H 32000 3 D M A 161 4 LET M = 0 5 FOR N 1 TO 15 6 LET A NI = N + 37 7 NEXT N 8 LET A +16 - 0 9 FOR N=1 TO 16 10 LET B RND 161 11 LET C = A NI 12 LET A (N) A B) 13 LET A (B) C 14 NEXT N **15 CLS** 16 PRINT SLATE BY D BELLCHAMBERS" 17 PR NT 19 FOR N 0 TO 3 20 PRINT CHR\$,130) 21 FOR C 1 TO 4 22 PR NT CHR\$ (A(N * 4 + C.). 23 NEXT C 24 PRINT " 25 NEXT N 26 PRINT 27 FOR N 1 TO 4 28 PRINT CHR\$ (131), 29 NEXT N 30 PRINT 31 PRINT 32 FOR N 1 TO 15 33 F NOT A (N, = N + 37

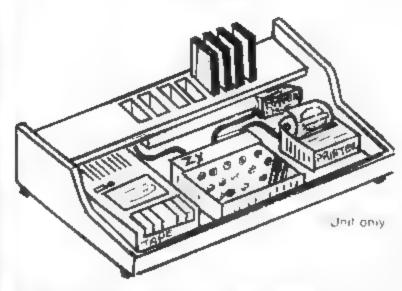
34 NEXT N 35 PRINT ' COMPLETED N', M, 'MOVES' 36 IF M< H THEN LET H M 37 PRINT 38 PRINT 'BEST SO FAR IS", H, ' MOVES" 39 PRINT 40 PR NT "ANOTHER GO?" 41 INPUT A\$ 42 F CODE (A\$) = 62 THEN GO TO 4 43 STOP 44 PRINT ' WHICH LETTER?" 45 INPUT A\$ 46 IF A\$ >"9" AND A\$< 'P THEN GO TO 60 47 CLS 48 PRINT CHEATS NEVER WIN 49 GO TO 37 50 FOR N 1 TO 16 51 F NOT A (N) = CODE A\$) THEN NEXT N 52 FOR C 1 TO 16 53 IF NOT A (C) O THEN NEXT C 54 F NOT ABS (N C) 4 AND NOT ABS (N |C| = 1) THEN GO TO 47 55 LET A (C) = A,N) 56 LET A NI O 57 LET M M + 1 58 GO TO 15

Lines 1-3 Line 4 L nes 58 L nes 9 14 Lines 15 31 Lines 32 34 Lines 35-39 Lines 40-42 L ne 43 Lines 44 45 L ne 46 Lines 47 49 Lines 50 51 ∟mes 52 53 Line 54 Lines 55 56 Line 57 L ne 58

Initialisation Reset score Reset the board (all pieces in their winning positions) Scramble the board up Display the board Have you finished the puzzle yet? Yes you have! Well done! Print score and hiscore Want another go? guess not!! Which letter do you want to move? s it a valid piece? No it wasn't Find the letter in the grid Find the space in the grid is it a legal move? Move the letter and the space around Add one to the current score Go back and display the new grid s tuat on

THEN GO TO 44

TO ALL SINCLAIR SPECTRUM AND ZX 81 USERS



Plakaya those untidy wites with his a mazing new in designed by a fige tron se Pt his unition a chair — the flour on your ap Move 1a1 Line go Made . Deal qually , whood and polished high or dark tah 19any 0, back

Pease slate could at £23.50 idition of vAT & P&P

Picase send cheques, PO to

E R CAMERON & SON LTD H/O 9 The Vineries, Enfield, Middx EN1 3DQ.

We have been making things in wood since 1870

HIGH-RES ZX81 PROGRAMS

We willso a SOFTWARE ONLY technique to produce a HIGH RESOLUTION DISPLAY on the JAMODIFIED 16K ZX81 NO HARDWARE ADDONS ARE REQUIRED for the following programs

reviewed exterically a ZX Computing—the H resideplay really does break new ground an excellent game—an outstanding achievement. As well as the Ht resideplay the facilities offered are represented. Action is proofts and feet took and the deploylon when his really is shartering— Need viets where

enables you to use high resolution graphics in your own programs
The commands are CLS PRINT PLOT POKE DRAW SPRITE and
SCREENOFF Comprehensive adding fack tree are provided and
the Glaphice commands are easily incorporated into BASIC programs

The Caphride commands are seasily incorporated into basic programs

an advanced arcade game nonroporating five different sheets —

INVADERS GALAX AMS ZORF AMS METEOR STORM & MOTHERSHIP

Progress vs. difficulty and a significant partitions

—a fest moving arcade type game. Shoot down the saucure as
they dert across the acreen firing their missiles. Progressive difficulty

NEW LOW PRICE £6.95

CAVE CRUSADE the it a lest moving game in which the player must escape from a cave pursued by its feroclous which tants. This game does not use high resolution graphics but the normal graphics are used to good affect. NEW LOW PRICE

FOR THE 48K SPECTRUM

SPECTRAL ZORF — similar to our ZX81 program but using colour and sound
[4.95 This is in lact five games in one as the player can choose to play
one sheet continuously fandesized. NEW LOW PRICE!

CHILD'S FLAY —dos good as a teaching and for pro-school children with the partic partid of a parent or teacher. Excellent use made of the Spectrum's colour graph or makes this an enjoyable program to use NEW LOW PRICE!

SPECIAL OFFER

Buy two or more programs for a d scount of £1 par program !!!

We are openently looking for quality Spectrum softwars for which we pay upto 3% royalities. If you have we then such a program then saids sample to a force monediate are sation. We are also interested in programs written using our GRAPHICS programs for the ZXB1.

Trade enquires are we come

ODYSSEY COMPUTING 28 BINGHAM ROAD, SHERWOOD, NOTTINGHAM, NG5 2EF

DAZRAM

adds COLOUR SOUND A Ling YST TIKS FAST GRAPHICS and more to your ZX81 by inking in a commercially available compute video game. PLUS you in a comorwing some of our E-OOC in ash prizes for you programs if you own one or the viries games listed below incomallines, and be yours of £49.95. If you do not two lines her askellad variety our amazing allocations. aunch offe

BOY'S ATAMA F DAY THY AND SHOWING YOUNG BALLANDERS OF SHOWING YOUNG deministra alla afun Deministra de Mentra de Constitución de C



DATABASE

2 handseta — spring return loysticks: A II converter in rinnsple 14 push-buttons on ea hi 8 programmable notours. So lid in rugh Tivil speaker. Tone white noise generator built in explusion such di Object prientated graphics: 26 ptug in A i Milland dges available notwill including Myorih and



DAZRAM

DAZRAM IS THE ENTERTAINING WAY TO LEARN MACHINE CODE

DAZRAM is THE ENTERTAINING WAY TO LEARN MACHINE CODE DAZRAM wasses by having a 4k static RAM which can be software switched on the ZX81 to the video game. The unit plugs on oithe ZX81 expansion stoll leaving if feet claud in princers, an values eit. The other end plugs into the cartridge suct if the video game either directly in vialacartridge adaptor patent pending. Prigrams are written in 2650 machine code on the ZX81 keyboard using the monitor ROM in DAZRAM DAZRAM has a manual to nach you assembler and machine indeprogramming and all the information has you liked oip og arm the game. The ROM also contains ready written subtrout nest that you in an append and parch in olyot likely games. HELP which allows you to change shapes clobuls sizes and positions before you leally understand the programming PLS strings like binary to Mexiconversion relative offset calculation and debugging trings res binary to Hex conversion, relative offset calculation and debugging mulines

JOYSTICKS FOR SPECTRUM

Transfer of the second

A single from rise in the	9 9 4 16	# #u##	10 y 50 H		W.1	VDF	€5 95
Mr. H. H. W. W. D. CHARLE	Py F I	4.0.					
医胚胎 肾乳管 医切除血病 医	9.9	1 v3 h	7'	321 II	v II -	42 41	1
ati wigging to							
Pr 4	31	-0	h .	8.4		. h 5	. 1
11 11 11	If It If If I	N	1 11 -	4 4	4	Lil	
A C 1 1 1 1 1	5 10						
Spa na zb	n 4 3 1						£24.00
hy had de-							£27 50

Vollmace Ltd. Park Drive Baldock, Heris, Tel: (0462) 894410

11 3 119.

Please send me One Database Computer Video Game plus Cartridge and Free DAZRAM	£79.95	
One DAZRAM	£49.95	
One Cartridge Adaptor state or which model	£4.50	

Carridge Adaptors are evallable for ACETRONIC MPU 1000 and 2000: RADOFIN 1292 & 1392; PRINZTHONIC VC 6000; INTERTON VC 4000 Prices are inclusive of vAT please add to packing and posting **Detabase 64.50**, **Degram £1.60** cartridge adaptor 50p. Send stamped add essed

your the מים east y to

the

175 the

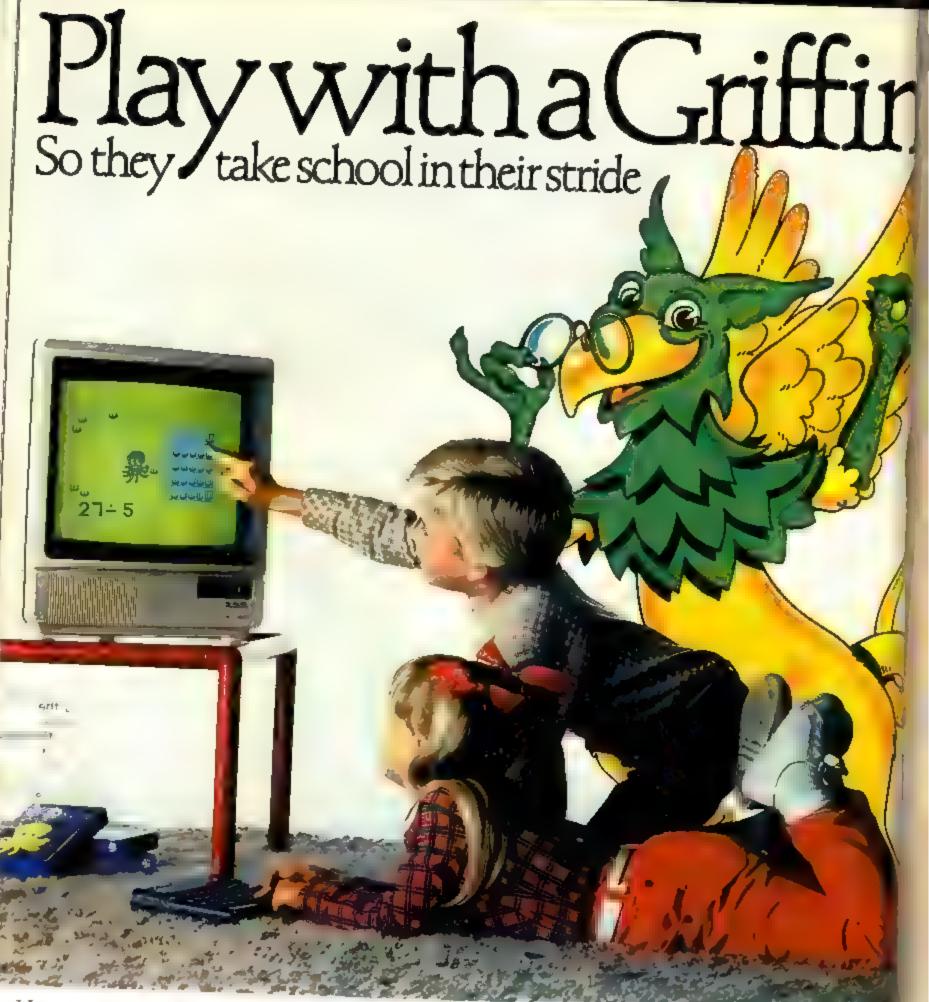
s bie

'y to ect is e

t on

ine

re



Your children are using a computer at school far more often than you think

Computers make learning an absorbing game and retain a child's interest and participation

Criffin Software have selected and adapted for home use a senes of Griffin educational software actes already used in schools.

The first six titles suitable for 4 to 8 year olds. are avallable now.

If you have a ZX Spectrum 48K or a BBC Model B microcomputer at home you can so easily keep up the school's good work. And the beauty of it is, the child sees it as a game!

Wordspe,, helps with spelling Tablesums unravels the mystenes of tables: Fairshare uses Olite the Octopus to make sense of division. Numberfun makes addition and subtraction easy. Wordgames helps with

spelling and expands vocabulary and with Getset a child is helped with counting.

All good fun!

Griffin Software titles are at W.H.Smith, Boots, and other computer shops even author







CITI

whe statt of the game you must select a level of difficulty rom one to five if we being the hardest and a most impossible The object of the game is to move around the maze, you bemgthe riverse quates using the arrow keys 5 to 8 unti you find one of the signs

* or When you find one of these signs you simply leaf it The computer will then diear the screen, and set you five question, their hardness depending or the evel of difficulty selected at the start of the game. After three five questions you are given a percentage rating depending on how many sums you answered correctly. After this press any key and the faithful ZX81 w put you back in the maze to carry on the

On leave

ide R

You may have the maze at any

time, but obviously the idea is to get as many points as possible You get one point for each correctly answered addition or subtraction question, and two

points for each multiplication or

division question

Burgess Hill.

to it from Nick Brown of

At the end or cach game when you have reached the exit you are to diyour score and given three options to play again at the same evel to stop or to play again at a different

GOSUB

GOSUB

805UB

20

30

A great game with an educational twist

Your move he if around maze is quite fast for a P program this sidue to the six ness of the loop times 100 t 300) and because the r work is done by subroutines.

Type in the program pub shed then before RUMF. the game, type the following

POKE 16510 0

1 PRINT AT 0,0," KATHS MAZE.

REM *** MOIN ROUTINE ****
PRINT AT A, B, "
PRINT AT A, B, "
LET A** INKEY\$

Program description

Hare follows a breakdown of the program's operation

Lines 100-300 Main routine lines 1000-1080. Print the maze.

lines 3000-3060. Set the sums deciding which sums you

chose

unes 3070-3168. Set the addition sums lines 3170-3269. Set the subtraction sums

unes 3270 3369. Set the multiplication sums Lines 3370-3800. Set the division sums

unes 5000-5180. End of game routine

unes 6500 6600. Set the values for the sums. unes 6800 6840. Clear the screen, leaving the top line

unes 8000 8500 i variables routine.

unes 8600-8900. Introduction, also set level of difficulty.

unes 9000-9020. Load. The program will automatically run on subsequent loadings if the program is SAVEd

A1-A LET B1=B 160 LET A-A+(A\$= 6" AND A(20) -170 L LET AND A>2) B=B+(A\$="8" AND B(27) -180 LET A\$="5" A AND B)3) PEEK=PEEK (F+33*A+B) 190 PEEK = 128 THEN GOTO PEEK = 189 THEN GOTO 100 IF 580 5000 IF PEEK=189 THEN GOTO IF PEEK (>8 THEN GOSUB 210 220 230

A=A1 LET LET 240 8=81 **GOTO 100** 300

京日開 ・・・・ 時時三日 ・・・

8500

8000

1000

using GOTO 9000

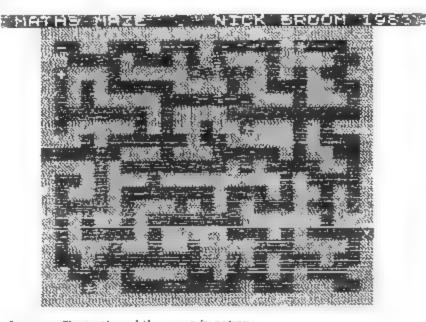
AT 1,0, TAB 3," 1010 PRINT AT PRINT 1000 PRIMI TAB 3, Tari TAB 3." PRINT TAB 3, 1060 PRINT AT 2,4,"5", AT 2,22,"5"; AT 4,4,"5", AT 8,18,"5", AT 11,18, "6", AT 14,26,"5", AT 18,17,"5", AT 20,5,"5" 3000 REM *** SET SCHS **** 3010 LET QUES=DIFF*50 3020 FOR X=1 TO 21 3030 PRINT AT X,0;" NEXT X PRINT RT 4,0,"LEVEL ",DIFF GOTO_(PEEK-149) *100+3070 3040 3250 3080 REM PAREDITION 3**070** 3075 LET COR-0 FOR X=1 TO 5 3080 3090 GOSUB 6500 3100 PRINT AT 2,10," EDGITION " 3110 PRINT AT 6,0," SUBSTICE " CHR\$ (X+156)," " 3120 PRINT AT 7+X,3,01, '+'.02,"= 3130 3130 INPUT B\$ 3135 IF B\$="" THEN GOTO 3130 3140 IF UAL B\$=03 THEN PRINT B\$, 3145 IF U 3145 IF VAL 84=03 THEN GOTO 3157 3155 PRINT 03," BROTE" 3157 IF VAL 84-03 VAL BS=03 THEN LET COR=0 OR +1 60 NEXT X 62 LET SCORE=SCORE+COR 65 PRINT 'THAT 'YOU GOT " RIGHT.", "THAT IS COR #16 PERCENT! 3160 3162 3163 COR, COR #128 /5 PRINT / PRESS ""N/L"" TO 3164 CONTINUE. INKEY \$="" THEN GOTO 3165 3165 IF GOSUB 6800 GOSUB 1000 3166 3167 3168 RETURN REM R SUBTRACTION. 3170 LET COR=0 FOR X=1 TO 5 GOSUB 6500 PRINT AT 2,8," SUSTEE: 3175 3130 3190 3200 3210 PRINT AT 6,0," B.ESTIV.", (HR\$ (X+156)," """ 3220 PRINT AT 7+X,3,01,"-";02;"= CHRS (X+15 3230 3235 INPUT C\$
IF C\$="" THEN GOTO 3230
IF VAL C\$=03 THEN PRINT C\$,



3260 NEXT X
3260 NEXT X
3262 LET SCORE=SCORE+COR
3263 PRINT ',',','"YOU GOT "; COR,"
" RIGHT."," THAT IS ", COR # 100/5,"
" PERCENT."
3264 PRINT ',','"PRESS ""N/L"" TO INKEY \$="" THEN GOTO 3265 3265 IF GOSUB 5800 GOSUB 1000 3266 3267 3269 RETURN 3270 REM 3273 FOR COR = Ø X=1 TO 5 (RND * (DIFF *3) +8) (RND * (DIFF *3) +10 3275 91=INT LET 02=INT 3288 LET 03=01*02 PRINT AT 2,8;" PRINT AT 5,0,"
(X+156),"
PRINT AT 7+X,3,01;"* 3295 CHRS 3300 PRINT 7+X,3,01;"*",02,": 3310 INPUT D\$
IF D\$="" THEN GOTO 3318
IF VAL D\$=03 THEN PRINT 04, 3315 OR+1
3355 NEXT X
3357 LET SCORE=5CORE+COR+2
3360 PRINT ,,,,"YOU GOT ",COR
" RIGHT."," THAT IS ",COR+100/5,"
" PERCENT."
3362 PRINT ,,,"PRESS ""N/L"" TO G03UB 6800 3355 GOSUB 1 3368 1000 3369 REM 3378 3372 3374 i – distributation, P LET COR =0 FOR X_1 TO 5 LET 01=INT (RND+(DIFF+5)+18 3375 LET 3377 LET 02=INT (RND+(DIFF+5)+10 3380 LET 03=01+02

```
PRINT AT 2,10;" | 1,000 | PRINT AT 5,0," | 1,000 | PRINT AT 5,0," | 1,000 | PRINT AT 5,0," | 1,000 | PRINT AT 2,10;" | 1,000 | PRINT AT 5,00," | 1,000 | PRINT AT 5,000 | PRINT AT
  3395
  HR$
                                                                    AŤ
                                                                                            77x,3,03;"/",02;"=
  3400 PRINT
  3410 INPUT ES
3415 IF ES="" THEN GOTO 3410
3420 IF VAL ES=01 THEN PRINT ES,
 3425 IF VAL ES=01 THEN GOTO 3435
3436 PRINT 01; " METTE"
3435 IF VAL ES=01 THEN LET COR=C
  CR+1
CONTINUE..."
463 IF INKEY$="" THEN GOTO 3463
  3463 IF INNE,
3470 GOSUB 6800
3480 GOSUB 1000
 S000 REM #### THE END ###
5010 GUSUS 6800
5020 PRINT AT 8,0," JOU HEVE SEE
THE ENT."
5030 PRINT ,," YOU SCOPE?
E," POINTS AND YOU SCOPE?
 5030 PRINT , " YOU SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED ", SCORED 
   0 PLAY",,"""當"" TO STOP",,"""這""
TO CHANGE LEVEL."
507@ IF INKEY$="" THEN GOTO 507@
508@ IF INKEY$="S" THEN STOP
509@ IF INKEY$="P" THEN GOTO 51J
   *095 IF INKEY$="R" THEN GOTO 516
   5100 GOTO 5070
5110 GOSUB 6800
                              LET SCORE = 0
LET A=10
    5120
                            LET
   5130
   5140 LET B=3
5150 GOTO 30
5160 GOSUB 6800
5165 PRINT AT 6
5170 GOSUB 8660
                                                                                         6,0,
                           REM FET NATUES F
    5180
    6500
                           LET G1=INT
LET G2=INT
                                                                                                            (RND +QUES) +20
(RND +QUES) +50
    6510
    6520
                                                PEEK=149 THEN LET
                                                                                                                                                                            83-81×
    6530 IF
     8540 IF PEEK-150 AND G1(G2 THEM
     GOTO
                            5500
    6550 IF PEEK=150 THEN LET 03=01
    02
   6500 RETURN
5800 REM - BLEGS SCREEN +
5810 FOR X=1 TO 21
5820 PRINT AT X,0;"
     5830 NEXT
                               RETURN
     584A
                               REM SER MARIAGLES +-+
     8000
     8219
                            LET
                           LET P-PEEK 16396+256*PEEK 3
     9955
     8030
     6397+1
     8040 LET COR=0
8050 LET SCORE=0
      8500 RETURN
     THE
                                                                                                      SIGNS (8.8.8.8)
CORRESPONDING QU
               PICK UP
                       ANSUER
      ESTIONS.
      3655 PRINT
                                                                                                                  TO MOVE USE
                                                                                                                                                                         508"
```

3660 PRINT ,,, "PLEASE ENTER LEU
EL OF DIFFICULTY"
3670 PRINT ," FROM 1 TO 5 (1
EASY/5-HARD)"
8680 LET A\$=\text{TMKEY\$}
8690 IF A\$=\text{" THEN GOTO 8680}
8695 IF A\$=\text{" THEN GOTO 8680}
8695 IF A\$=\text{" OR



A screen illustration of the maze in action.

HDDITTEM

FENSE I

🐲 GUESTION S 🕦

28+/1=99 MRONE 63+96=161 WRONE 34+92=126 RIGHT 26+73=99 RIGHT 51+89=150 RIGHT

YOU GOT 3 RIGHT, THAT IS 60 PERCENT.

PRESS "N/L" TO CONTINUE...

An example addition test for someone playing the Maths maze at level one

YOU SCORED 28 POINTS ON LEVEL 3

PRESS "F" 10 PLAY S' TO STOP "B" TO CHANGE LEVEL.

When you have finished playing on one level, you are presented with your score and given the option to play again, stop playing or to change level.

б"

5,

TO

265

10

** --

3 (4)

350

3=0

DR,

15,

70

363

+10

+10

New books and software are cropping up everywhere. Here's the pick of the bunch.



MASTERING THE ZX SPECTRUM

by Lawrie Moore

This book siabou his vito en ov your Spectr im through learning programming and handing the machine id spest ementa. block which somet may occurs folloginners that originsping and anderstanding the building of a program.

Denk nave 83 185312 700 X

apprix 150pp (5.95

Paris or by Elis Horward or Chapter or area are set you or of less Kidons of



DYNAMIC GAMES FOR THE ZX SPECTRUM

by Tim Hartnet

This book provides 20 dynamic gaines or lasting nie est They range from hold 1 yarres ke Chass at Pirandelin, ty arcade a for a logger and Death we 2000 and or ude a rajor advent re galle Reverge of Cast e Dread A detailpre e trodució si s provided for evely game.

0946195 37



WORDPOWER Vocabulary and Spelling

by Sulis Software

WORDPOWER is a powerf 1 palikage on its ning more than 1200 words nouding opposites synonyms nouns adjectives collectives aids miles Alchoce of wo games plus a key mop or and different levels of difficulty make up it impulsive package and your short indivolute packing a new punction havords you've never known now to use before

0946658021

Publish by Suits Schware Life ammarkered by John White & Sons Life



TENSE FRENCH Know Your Verbs

by Sulis Software

TENSE FRENCH leadings you how to get I ose basic French veras right. The intre beasts are transated sied and lesied so had w ether y we a got for any ages or no her word bother you again Working in the tense of your chace you do be whether you want to be tested will en and what on

1946658142



SPELLBOUND BESIEGED Spelling

by Sulis Software

Can you get your insading knights across the raying to relieve the be eaguered city. or wither tides ge there 101512 Every word spet right in his game is a sale crossing for one of your knights. Spall a word wrong and the infide's w have an advantage over

0946658048

Publisher of Suissauffware und an inkident yn it. Dir ey fi Sons ynd

Parter to San 5 may

Casser e

THE MICRO CLOAK AND DAGGER BOOK Codes and Cryptography on

Sinclair Microcomputers

by Gareth Greenwood

Cryptography siar absorbing subject which has had a steady ama eur to owing for many years particularly an angst young recharge you nided schoolboys. The advent of cheat personal computers now makes it institute for the interested person to expans entdirectly will codes and ciphers using the maining as an encrypts a device To s book s or ented around the use of a com,) ter for pro-1 a exper mental on

Contents holide Serret Communical ins ZXB1 As a Ciphe Ma ne Simple Cipher Systems Soving Simple Substi on Ciphers Less Simple Transpositions Breaking Trans position Codes Trug er Chers Christ Security

18600

Parties and Sin a discount of and

Decembe 83 0905 04 498

מעול אר נה מעם 3pp α> ε 94 Pile shed is organized that the and I harketed by John Wiley & Sore aid



THE SINCLAIR SPECTRUM IN FOCUS

by Mark Harrison

This book supplements the Since a rioporating manual providing answers this ame of the questions prised but left unanswered it is designed for readers I all ages with either no previous computer experience or howe requiring more assistance

SINCLAIR SPECTRUM AND ZX81 ADD-ONS Microcomputer Hardware Projects by Natasha Graham and Michael Roberts

Contalls all you need as an ntroduc to 11) microcomputer in erfacing hardware lesign and much he code programming The Sincial computers are well known for running sim, e BASIC programs and for game playing but how many people have used them for hardware projects? we of the most excliny areas ar any geing a micro lo do something use This buok takes you step by step from nervous y swift ring on he so dering for through to challe iging projects such as controlling ights aw tehes and simple video games. Through these projects, machine code programs are written which contro the externa hardware

15 95

тчВру I6 25 Project of VS and 1 - In the Press and mark tension on Win Sound and

Decembe 83 арумох эбрр 0905104 641 approx £6.95 Patrished by Sigma Technical Press and management by John Willey & 5 age and

[2] John Wiley are major publishers and distributors books and software for the computing world. As well as Wiley professional reference books and so: ware an extensive range of titles for the student and

hobbyist is available by other leading publishers including Ellis Horwood, NCC, Sigma Technical Press, Sinclair Browne and Sulis Software Ask for further details now at any good bookshop.

The best three of '83

Nick Pearce and James Walsh take a fond look back at the three best software packages they've seen during 1983.

The Spectrum overview

A lot has happened on the micro scene during the ast livelye months. The Acorn Atom has at ast been aid to lest, and the Electron, Aquarius and Memotech micros have emerged. One thing that has solidly held its ground whilst others come and go is the Spectrum.

Not that the Spectrum fraternity has been standing still During the last year Ultimate has blasted its way onto the scene Imagine have consolidated their ead as the offtware company with most money and biggest gimmicks. Crystal have risen to be one of the most prestig ous software houses in the UK. The list of events goes on — As far as software is concerned 183 must be counted as the most astounding so far.

For no other computer has here ever been such an influx of better and better quality software it is definitely significant cant when looking at the titles which I have chosen to include mmy Hall of Fame '83' that they have all been put on the market during the latter half of the year. Much of the software. introduced between this time ast year and the summer has now been noticeably outdated me of the main exceptions being The Hobbit by Melbourne House. This partly being due to the mmortality of the book. but also to excel ent program-

≥II

ra

tep

ıd

Opp 95

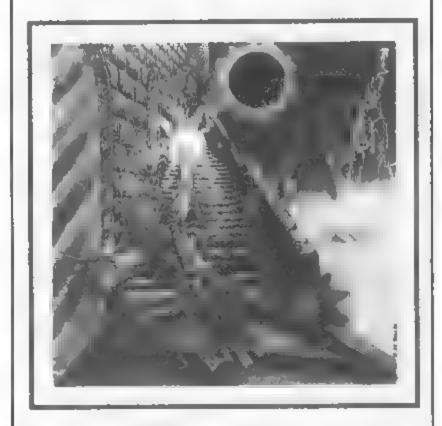
Personally . . .

There is a good chance that you will not agree with my choice of best program, as no pure definition of a 'good propam exists. For this reason would like to state the criteria on which I have based my thouse.

1 Originality, this applying to the game scenario rather than programming gimmickry or technique

2 The use of the computer, whether it uses its capabilities in the full this largely means

HALLS THE THINGS





that BASIC programs were not considered

3 Quality of programming and initiative, whether it runs fast and smoothly, the quality of graphics and sound etc. and the use of new ideas.

4 Playability, in that algame is of little use even if it is a programming masterplece if no enjoyment is derived from playing it. Now down to the programs themselves

Halls Of The Things

I shall first set the scene

Tam standing at the bottom of eight flights of stairs leading up and up around the tower. I can see the dungeon, in which the key es, but without the sevenings I cannot enter must endeavour to find the rings, though am safe out here eternity is a ong time to wart in the cold. So here goes, up two

flights of stairs in one go. Help! There is a Thing' waiting for me ust inside the entrance, a quick flash of lightning and he is left smouldering close shave at that In further and through the first door A half full bottle of e x r on the floor could do with a little extra sustenance after that frightening encounter. Now on with the quest in hand Through the next door and there stands two more 'Things'. A quick couple of lighthing bolts and a rapid exit should do the job Hang on that is a frebal he is using it must be, it is following mell can play at that game. I was lucky this time one of their own lightning bolts rebounded and hit them. They ike smou dering in amongst a pile of treasure. Might as we have the treasure whist I am here suppose t could come in handy I must be getting pretty low on magic by now. I'll have a quick low at my status I was right,

and m wounded must have taken more of a beating in the last conflict that I thought. The best thing to do is hear myself with some of my remaining magic and rely on arrows and my sword until can find enough elixir to replenish my supplies. This maze seems to go on and on, is there an end to it, the rings must be somewhere.

An extract from An Addict's Guide to Things , by Arthur and C. Clark

From the above extract you should have gained a small in sight into the very intense excitement the 'Halls' involves The idea of the game is based on the traditiona "Dungeons and Dragons Adventure' scenario Your aim being to make your way through the multi evel maze collecting the seven rings and killing monsters as you go Once the seven rings are found you may leave the maze travel down the staircase to the lowest evel the dungeon. When inside you must frant cally try and find your way to the key before the enormous number of Things manage to get to you. Getting to the end of Halls' s far from an easy business It is kely to take you weeks and weeks before even getting near

Each level, except for the dungeon is an enormous maze. with hundreds of rooms and cordors. Many of the rooms are enclosed by doors which may be opened or closed by either yourself or a Thing An assort ment of objects may be found in a room if you are lucky a bottle of exir will be lying full or partially ful, on the floor Unfortunately the Things also have an affinity for it. E iter will boost your magic level and allow you to fire more lightning bolts and frebals as wer as healing yourself Treasure may also be found, this may be collected and so add to your score But beware 'Things' may disquise themse ves as treasure and suddenly attack you. The only way to check is to try and fire a arristr ing bot If a Thir

vicinity then the ligid will go for it, if not no actionally be taken as lightning colonly be fired if something is in the general area.

The one aspect which may put people off 'Halls' on the first encounter, is the large range of controls available It will probaby take about 10 to 15 minutes before they will become second nature. Really, the game. s very simple to play

'Halls' lacks sound because of the immense amount of time. which the computer would have to spend processing it, so slowing the game down to an unacceptable level it is also difficult to control by joystick, unless you have one of the universal

As far as I am concerned and I have seen quite a large amount of software over the last year, this is the most exciting and in novative computer game , have seen for the Spectrum. No other game runs with such speed. smoothness of action and graphical quality Crystal Computing have shown just how far it is possible to push the Speci trum, making some of the claims for more expensive micros, such as the 'Beeb and Dragon look really rather silly. The question on the tip of my tongue is whether Crystal will be No. 1. next year? It looks possible

3D Tunnel

3D Tunnel went on the market back in the beginning of the sammer. Written and marketed by New Generation Software it was first received in this magazine back in the June July edition. Since then Malcolm. Evans has also released 'Knot in 3D', another blockbuster, which was reviewed in the last edition 'Knot' may also have figured in my 'Ha of Fame '83' had it not been for the earlier in troduction of 3D Tunnel, which just pipped it to the post

The scenario of 3D Tunnel must be the one of the most graphically ambitious I have yet seen You are racing down to 3D tunnel infested with rats, bats, spiders and frogs! Whilst trying to steer your way through the tunnel itself you must either avoid or shoot any anima's which come toward you. Finally, you have the task of avoiding a condon Underground train (48K version on y) graphics for this are noredible. A sheer delight to watch. As for sound, this too is very well catered for this s certainly a surprise considering the enormous speed at which the game

as well as three speeds, you are also given the option of practice runs at certain stages of the game as wer as a demo mode

Having played 30 Tunnel for



many hours I still find the fastest mode dauntingly fast, which is a good thing who wants to be able to beat a game at its top level too guick y?

There may not be much depth to the scenario of the game, but the graphics can only be described as breathtaking When I first saw it I could hardly believe it was a mere Spectrum at work. The addition of a slight y cut down version at 16K is very useful, especially considering that the other two games in this 'Hall of Fame are both for the 48K only 3D Tunnel can be heartily recommended to ail ages, especially those who wish to disp ay the real possibilities of the Spectrum this will stop many a 'Beeb' owner in his/her stride

A truly professional program of outstanding quality and mpact it is so addictive that after many months of use, its fun and excitement have hardly lessen-

Manic Miner

Manic Miner is one of the latest releases by the longstanding Bug Byte Bug Byte has been around on the micro scene right back since the 'old days of the ZX80 Over the years they have built up a reputation as a highly business, ike professional body, producing high quality software in colourful packaging advertis ed over glossy spreads and be-

ing sold in just about every retail outlet available. Recently there have been some reservations as to the quality and originality of the individual games. Fortunatiey, Manic Miner has come to dispel these. Though the packaging is of the norma professional standard, the game is the real masterpiece I had no hes tation whatsoever when including Manic Miner in my 'Hall of Fame

Miner Willy is the star of the show. Whilst prospecting, he stumbles over evidence of a lost civilization far superior to our's To maintain such a civil zation it was necessary to mine vast amounts of precious minerals When, many aeons ago the empire crumbled and this world apsed into a dark age, no-one thought to nform the mine workers, who were in fact robots anyway Willy realizes that there is a fortune to be made if he can find the hidden store Your task is to guide him through the 20 underground caverns collecting the keys so as to progress to the next cavem. Each cavern s an arcade game in itself. Apart from the problem of Manic Mining Robots who are out to get you, there are also Poisonous Pansies, Spiders, Slime, one way conveyor belts, collapsing floors and lots more besides. In each cavern, the probiems are slightly different but never easy. Some of the monsters created are incredible

Each being perfectly defined at controlled

The introduction to Mark Miner entails a display of the site face of the mine and the hom of Willy There is also a tu graphical keyboard on which: line s played with the at propriate notes lighting up as i proceeds. Once this is over an you have not selected to perthe game, a demo mode will poceed, showing displays of all 20

The sound is fantastic the graphics are excellent while the programming is bright This must be the most colourly game I have ever seen. This is highly recommended for arcase freaks everywhere The control are simple only left, right and ump, hence making playable by anyone Though may take hours before pro ceeding past Cavern One this! tse fis a game. Manic Miner an absolutely fantastic game very highly recommended Have a very happy Christmas James Walsh

The ZX81 overview

With 1983 fast drawing to a close, this is the time of year when it is traditional to look bati over the past tweive months and take stock

I have seen a considerable number of cassettes during 1983 Some have been pretty mundane many were very good and a few were outstanding either in terms of their originality or because they broke new ground in the software market It must be said that many of the major advances in ZX81 soft ware were made in 1982 afraid 1983 is un kely to be remembered as a vintage ver for software But then again this is hardly surprising as the ZX Spectrum and a host of other cheap computers have been primary attractions and the ZX81 introduced nearly three years ago and still extremely popular, is beginning to fee its age in computing terms

Spoilt for choice?

have chosen my three best packages using the following criteria ongevity a program which survives constant use and remains as interesting as it first did, technica innovation as to how we the programmer has used the capabilities of ZX BASIC and the mitations of the ZX81's memory, and originalitv. The kind of program that any ZX81 user would be happy to find in the r Christmas stocking.

I have not interpreted my

d and Man c e sur home a ful nch a apas it r and play Il proall 20 , the whilst liant ourful his s rcade ntrois

nas ew

nt and ng it

ugh it pro-

this in

iner is

me

to a year back onths

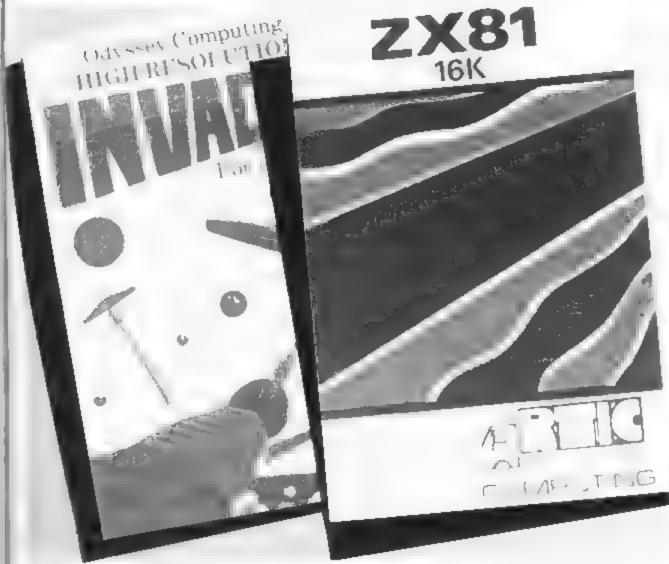
эгар е uring pretty good nd ng na ity new arket of the soft - I'm to be vear again he ZX other been d the three

97 best pwing ogram t use g as it on, as er has of ZX

emelv

eel its

of the gınalı at anv py to akına d my



blief too iterally in that some of the chosen three were in fact produced late in 1982 a though their impact on the software market was only felt in 1983 Also Thave been unable to resist mentioning more than the stipulated three (perhaps will be permitted to look back at four packages in 84 and five in 85

Equally, for fear est this short summary become a little more than a catelogue of ZX81 software have not made too many references to many other great cassettes which I'm sure VDL will have come across this year. My selection is very much a personal one, and for the benefit of users of both the unexpanded and the expanded ZX81, I have chosen a cassette of 1K games a 16K game and for the more experienced programmer Artic's FORTH impiementation

The name of the game

Taking the game for the 16K 7X81 first Odyssey's 'In vaders package continues to provide enjoyment and Laiso use this game to demonstrate to sceptics that high resolution games really are feasible on the ZX81

As well as the mpressive display, the action is fast and responsive, and as a game is great fun Only Artic's Namter Raiders, comes to mind as being as exciting to play but this ver s on does not have the same H res display

Some users of Odyssey s game seem to have had some problems with the Hirres display

t appears that access to the horizontal hold on the TV is sometimes necessary to correct the distortion Persevere you'll find it s worth it!

You could also check out some of Odyssey's other Hi-res games, which I have heard rumoured are equally good

Someone with just 1K of RAM might appreciate a cassette such as Selec's Maze Guzzler in their Christmas stocking (They might prefer a RAM pack but Selec's offering comes a ot cheaper) Maze Guzzler' is a game after the 'Pacman style and all the usual facilities found on the 16K The games are available restricted memory has dictated a small screen display but it is nevertheless a very good game.

On the Biside of Selec's cassette is a game called 'Super breakout' This is a good 1K ver sion, again with a less than fullsize screen display. All Selec's 1K games cassettes are of a very high standard, aithough they have perhaps arrived a little late on the software market to achieve much penetration which is a shame

Another excellent version of Breakout s New Generation Software's Gamestape 6' JK Greve s tformerly. Gamestape 6) This uses a fu screen display and is a first class game, and good value for money too However since t was produced well before 1983 it doesn't really qualify for too much of a ment on here

GO FORTH

So much for games For the ZX81 programmer who feels like a change from BASIC, how about taking a closer look at Artic's FORTH package. Originally se ling for around £30, this mplementation now sells for £14 95 and should keep you more than busy over the Christmas ho day

The manual which comes with the cassette is not really intended for the complete novice, so if you re new to FORTH you. will probably need a book on the subject to help you through the teething stages

I dd not find this FORTH package particularly easy to use not, I hasten to add, a fault of

because of the slow Artic's ZXB1 cassette system. The FORTH compiler takes about six minutes to pad and the four screen editors take a further 20 or so seconds each. Apart from the in tial wait to get the FORTH loaded if you should crash the system half-way through a programming session, you will have a frustrating wait while you reload the compiler editor and start a lover again

Various versions of FORTH have been developed but this version is an implementation of Fig FORTH Artic supply a peet off' keyboard over ay which is intended to be stuck on the ZX81 keyboard. The keys are similar to those normally found on the keyboard with a few exceptions such as the FORTH words '@ and 1' on the W and Q' keys it doesn't have to be didn't use it as have a File 5 xty keyboard with moving but it does help you get used to the package

FORTH is considerably faster to run than BASIC and its power ies in the ability to allow you to define your own words for functions) FORTH already has an extensive range of words and the programmer can use these to create add tional words to do whatever is required. Once a new word has been defined it becomes part of FORTH's vocabulary

The compiler takes up something like 9K of RAM and what with the screen editors this only leaves about 2K left for the user to work within However as I ment oned before, FORTH is a very economical language and you can achieve a of within this confine

ZX FORTH s a first class implementation of this language and provides a good height into its pecularities. If it bites you it should be easy to progress onto a dedicated FORTH machine or another FORTH system as Artic have kept very closely to the standard language

Xmas adventures

Apart from the software mentioned here. I've got plenty to keep me out of mischief over Christmas have still yet to complete a of Artic's adventures Espionage sland alone should keep me from overdoing the food and drink and I shall need a clear head to brush up on my flying using Psion's 'Flight Simulation

On a ast note, ha Christmas to ai ZX Computer readers, and good computing! Nick Pearce

FROM FOX ELECTRONICS

M Your 16K spectrum into A 48K for @

keliky kit at a low, low price. This Speciality **外部的企业** denting or attending to your sollictum. Simply pushes the respection had stop by step metructions supplied and it for any on you are not statished with the kit return to us undernaged within 14 days and we will refund your money in full

SPECTRUM JOYSTICK

A DELUX JOYSTICK CONTROLLER COMPLETE WITH INTERFACE AND

- *CONTOURED GRIP
- •2 FIRE BUTTONS
- •4 FEET OF CORD
- 84 SUCTION CAP GRIPS FOR TABLE

TOP CONTROL £19.50

SEND NOW TO

FOX ELECTRONICS 141 Abbey Road, Basingstoke, Hants. Tel: 0256 20671



THE BEST AVAILABLE EXPANDABLE RAM PACK AT THESE NEW LOW PAICES!

16K £19.50

+ 45p P&P



32K

£34.00

+ 45p P&P

e. se rolle ship a The life and a first A TOTAL STA

SPECTRUM/ZX-81 **FULLER FD42** KEYBOARD

FOR THE SPECTRUM OR ZX-81 A42 KEY FULL TRAVEL CASED KEYBOARD WHICH YOUR MACHINE SITS INSIDE PLUGS N (NO SOLDERING REQ)

£29.95



ф6 - ₁₇ 11 г Tr. Tr. ds. tr. do. it £10 00



THE TOMB OF

DRACULA



For the 16K 2X81 or with colour and sound for the 48K SPECTRUM, a superb 3D graphics adventure game Enter Dracula's temb at 30 minutes to sunsat wrander through the tomb siple mapped 300 yaults in search of the tabled vampire's Treasure pick up valuable silver stakes and use them to defend pourself against the furking horrors ghouls combine pits of primaryal stime. See them all on the computer's plan of the tomb when it will let you. Take a change on a Mystery Yauls. I you dark And all the time the minutes are ticking by to sunsel when Dracular isses from his coffin and comes after you!



ESCAPE-OR-DIE ADVENTURE....!

For ZX81 with 16K RAM For 48K SPECTRUM

You are an Allied PGW in the infamous Castle Coldita, Naz You are an Allied Powr in the Intamoca Castia Counts, Ivarioritiess all for Allied prisoners of war. Can you escape with you life through he was abytinth or come to the main gale? Tackie brutal Gestape and 55 guards savage guard dogs 1 aps and pitfalls! Survive if you can the Corridor of Rata, the Turnel of Poisonous Spiders, the Vault of Human Bones and many more. And on your way grab all the (abulous Nazi loo) you can

Price includes ready to load cassette with library case and inlay, full instructions postage and packing. Order today! Money refunded if not delighted!

Send cash, P.O. or cheque to



FELIX SOFTWARE (DEPT. 19 Leighton Avenue, Pinner, HA5 3BW

Member of the Computer Trade Association

ZX81

BUSINESS

Maria L	£4.95
n, Y 4, (£4 95
Fra A-,	£4 95
TO BE A CHIV	£4 95
_ ^^.	£5 95
Вики	£5.95

ARCADE GAMES

h, 4 L		£4 95
A P W B		£4 95
nah h		£4.95
* y _ Jc		£4 95
(h g		£4 95
Part A Collins		£4 95

LITH ITV

Specific TXF Hy Div				II	TEL	UI			
	£5 95 £5 95 £5 95 £12 95 £5 95 £14 95					пı .		ти: -г -г -г	Zx F
d 14 v			100	Fi No	٦	1.1	X	M	Al _v M
	г	P		4	-1		v.	Port.	. 1
no con ta ta B	- 1			- F	# B		1 4	6 317	n n _r
1 p 2	h- 1i'				1.	7		(5	1

DISCOUNT SOFTWARE INC.

RCU PO Box 2530, New York, NY 10185

Tel: (212) 486 0980

SAVE HUNDREDS ON YOUR HI-FI-NOW!

HI-FI NOW! the new magazine with a new way of giving you the buying information you need – NOW!

HI-FI NOW! —will tell you the £99 speaker that sounds like £200—NOW!

HI-FI NOW! will help you spend £15 to make your personal stereo like a million dollars NOW!

HI-FI NOW! will even make sure you spend £2,000 wisely—NOW!

HI-FI NOW! answers the questions you are asking about by fi-NOW!



Wharfedale, KEF, Rotel, Sansul, Marantz, Koss, Sony, Pioneer, Filitachi, Just some of the names in the first Issue of HI-FI NOW!

HI-FI NOWI AT YOUR NEWSAGENT NOW! ONLY 85pl

games were previously available forms ZX81 & SPECTRUM SUPER SOFTWARE AT LOW PRICES CASSETTE 5 REVIEWS SPECTRUM ANAIS IN 181 CASSETTE 3 NVADERS CASSETTE A — Ten programs for £6 Willesden Landon NW10 90. GRAPH C DEMO BLACKSPOT MINEF ELD Please make cheqyes payable to ORWIN SOFTWARE CDNFIGHT code) DRAUGHTS machine code SALAKY INVADERS (machine code) CASSETTE ? GHOST GOBBLER MERCHANT (Busic) for 164 2X83 B games for 16k ZXB1 AD TIC TAC TOE Basics SNAKEBITE smachine enda is much taster than Basic a Standards **NEW FOR 16K** BREAKGOT INBChine code SOFTWARE ASER DEFENCE 00 MOUSETRAP * ISAEASI CASSETTE 1 BL 12 Imachine ALIENK LL CASSETTE 5 CASSETTE 4 8... Dept 2XC SX CON 120 Day NOV 83 ne linies ich D€ 82 SOFTWARE 1950 Appendig as passed to SYTE-MAN (machine code previously available from ORWIN CASSETTE 4 REVIEWS PACE RESCUE

YOUR MICRO COULD TEACH YOU A THING OR TWO ABOUT THE FRENCH...

...OR THE GERMANS...OR THE SPANISH

A nome computer is an expensive toy; and, if playing sames is all you do with it, a toy is all it is.

Now, using the New Personal Computer
Superlearning System (PCSS) you can have fun with
your micro and learn something at the same time,
PCSS language courses comprise 12 lessons on
3 audio cassettes used in conjunction with a fourth

initially the software package enables you to see the words you're learning; then, as your vocabulary develops, it will test your skill in your new language.

Anyone can learn this way – no previous knowledge of the language is required. The unique PCSS method develops your overall learning and memory skills in a way thats both relaxing and enjoyable.

Each PCSS language pack - French, German or Spenish - contains a comprehensive booklet detailing

MDa

COMPUTERISED EDUCATION SYSTEMS

(PGSS software incompatible with the ZXEt (18K), ZX Spectrum, BBC Micro. Acom Elektron Micros.)

Each pack comes with a full money back guarantee if not completely satisfied.

the 12 audio lessons and the function of the inference aoftware. Additionally the booklet expands on the broader benefits of the PCSS method.

At only £29.95 per pack PCSS costs less than other home language courses yet it offers much more in terms of education and enjoyment.

Complete the coupon below and try.PCSS for yourself—you'll be amazed what your micro can teach you.

Send your cheque or Postal Order for £29.95 made payable to MDA Modon Associates Limited, 561 Upper Richmond Road West, London SW14.7ED

or afte natively lelephone **Teledata 01 200 0200** and quote your visa. Oners Club Access or American Express number

Tick which Audio/software package you require (Prices include VAT Add £1.45 for postage and packing on each order

Please supply the following Aud o/software Packages

FRENCH

GERMAN |

SPAN SH

Name

Address

Machine Type

Memory Size



he bos' Spectrum spreadsheet voi can buy Written in machine coup to be faster to give you more space for data, and to allow more features to be included it is guaranteed uncrashable.

- * 99 columns or 250 rows.
- # Fully prompted input
- * Extensive repeat facilities.
- ★ Supports ALL Spectrum functions
- ★ Unique iterative facility
- * Totais, Sub-totals,
- + many more

"If more programs shared the quality of OMNICALC then we might see more Spectrums in offices"

Home Computing Weekly 3, 6,83

"It is deal for someone who has, ust found the spreadsheet concept, but it is also a very powerful tool for anyone who has used one previously". Sinclair User June 1983.

Complete with comprehensive manual. £9 95.





STATISTICAL LIBRARY

All tapes carry a DATAFILE program that enables the user to INPUT-EDIT-SAVE-READ data on tape.

TAPEI	Descriptive Statistics	6 99	TAPE VI	Principal Components	19 95
TAPE II	Statistical Tests	14.95	TAPE VII	Factor Analysis	19 95
TAPE III	Probability Distribution	14 95	TAPE VIII	Time Series and Forecasting	19 91
TAPE IV	Multivariate Datafile	14 95			
	Cross cabulations and correlation co	ethicients		Statistical Library	100 00
TAPE V	Step-Wise Multiple Regression a	ınd		BBC-Model B (disk)	125 00
	Analysis of Variance in Regress	юп	BBC-B and S	pectrum-48k (8 tapes)	100 00
		19.95		ZX 81 (7 tapes without Datafile)	70.00

Saga Software House

Scientific and Business Packages for BBC-Model B, Spectrum-48K, ZX-81(16K)

133A High Street, Acton LONDON W3 6LY



Coding

character size with this great utility written for us by P Greenwood of Sevenoaks.

The purpose of the program is to enable screen displays of large characters or user defined graphics to be created quickly and easily by calling the character or graphic from a brary of symbols stored in an array. On program fermination, the screen display is saved in high imemory, and is then available for inclusion in a new program.

The program is entertaining to use and some interesting effects can be achieved by mixing both normal and inverse characters on the screen The symbol brary can hold 54 characters each designed on a three by five atrix and as an aid Tenclose.

showing the numeric data of to create 54 possible ers. The program may with an incomplete braiving any new characters being added as and when required with the option to reidefine any previously created character.

How the program works

Lines 20 to 240 are concerned with creating a graphic character and storing the associated data in an array. The array subscript C is calculated by the subroutine at the 640 after which a check is made at the 100 to see if the character has a ready been defined. When character definition is completed press. Newline to enter the PLOT routine which works as follows.

I nes 260 and 270 set the initial printing position for the first character to be plotted line 290 requests a character the subroutine at line 640 converting C\$ into the appropriate ocation C in the

array The individual bytes stored in this string location are then POKEd into the first 15 locations of the line 1 REM statement. This operation is carried out by lines 330 to 390.

Line 410 copies the screen display to above RAMtop. Line 420 puts the chosen character at the initial print position. Lines 430 to 470 scan the Keyboard for an input with any XIV moves incrementing or decrementing the values held in addresses 16542 and 16544. Line 500 copies the screen display back from above RAMtop a jump then being made to line 420 where the chosen character is reprinted use 470 permits an

escape from this oop enabling the chosen character to be incorporated into the screen display when the 410 is next executed.

When character piotting is completed pressing Newline enters the invertiroutine executed by tine 560 Line 5% stores, the screen display above RAMtop. The final option is to tinish the program by typing. You not not be enter the plotting routine.

Creating the program

Reserve some memory for the machine code routines by typing the following direct rommands.

POKE 16388 0 POKE 16389,125 NEW

This sets RAMtop to 32000 Type in the Hex loader pipgram, Fig. 1 ensuring that ine 1 contains at east 109 characters. Enter the Mexicode as shown in the left hand coumn of Fg 2 terminating each Ine of code w h New me if a mistake is made n typing pressing New the will select edit mode indicated by an hyerse E being displayed Now type the cur rect code and continue or reedit as required. Terminate data entry by typing 22. Delete all nes except line 1 then press Clear

As a direct command type DIM A\$154 5,3) to create an array of 54 characters. Note that this direct command avoids the use of a line number in the program, and so careless use of GOTO cannot accident.

tally re-Di-Mension the array and destroy previously entered data RUN will also destroy data and so the program should a ways be restarted us ing GOTO 1 Add the BASIC lines such that the program is now as shown in Fig. 3. Type GOTO 1 and use Fig 4 to create the characters required entering a number followed by New ne for each of the 15 en ires per character. The character is built up and displayed as each entry is made. When data entry is compieted opt out of this routine by pressing Newline Step. brough the options by successful presses of Newline, vong Y in response to FX T PROGRAM? To save the program on tape start the cassette recording, then type GOTO 620

Using the program

Ensure that RAMtop is set to 32000. The program will start automatically when oaded but f are start is required, type GOTO 1 in response to 'CREATE WHICH CHARACTER? press Newline The next reply will produce the chosen character in the lower left hand corner of the screen. Steer the character into piece and fix using the keys as

The next character selected will be initially super imposed on he previous one and may be manipulated as before. You can opt out of this routine by press ing New ne For inverse graphics press "Y" in response to the prompt. A 'Y response to the next prompt will terminate the program. A screen dump Fig 5 shows typical theracters. The display has now been saved in high memory. To call this display in to a new program press New then enter the BASIC shown in Fig 6 Run this program and when the report code 0 60 ap pears each program line may be deleted. The graphics may now be displayed le ther by a direct command PRINT Z\$ or as aprogram ne eg 10 PR NT Z\$ followed by GOTO 10

A load of code

The machine code routines have starting addresses as tollows.

16529 C JP 16541 PRINT 16591 C DN 16604 NVRT

The routines C UP and C DN the old value



block move 727 bytes of code from the address of the display file to address 32000 and vice versa. The Print routine works as follows. The B and A registers hold the X and Y printing offsets with respect to screen 0.0 Steps 19 and 20 ncrement the display file address by an amount equal to the value in register B. Steps 25 and 26 then increment the display tile address by an a nount equal to 33 times the value in register A

Having established the prin ting position isteps 31 to 34 print the first three bytes of the en arged character. Steps 35 to 37 then increment the display file address by 30 to point to the corresponding printing position on the next line, and the next three bytes are then printed here. This process is repeated five I mes to print the complete character at which time the C register previously paded with five at step 27, has been incremented to zero and a reform to BASIC is made.

The INVRT routine finds each printing character in the display fiell adds 128 to the current value, then overwrites

Fig 1 The Hex loader program

1 REM	
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
10 LET x = 16514	
是多 【新产电子 · 异集	
38 IF As "" UR INT LEN AS. 2) (
LEM HE O THEN BOTE SO	
40 PRINT AT 21.0," ", A	ļ
T 21,1,8\$	
50 INPUT I's	
60 IF INT (LEM Z# '2) VLEN Z#/2	ì
多种自治 医疗不利 医卧	
70 IF Z\$4."" THEN GOTO 100	
83 PRINT AT 21,0,"3"	
90 GOTO =0	
LØB SCRCLL	
110 PCKE K.16 #CODE A\$*600E A\$(2	7
1. 1. 2. T. 上面下 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	
の 高力 きいはま 寮 才、)	
140 IP ASKAL THEN GOTO 110 150 IP Z4 ZZ' HEN STOP 160 LET 1# Z\$	
ARM TE 74 TZ: HEN STOR	
100 1 FT 75 75	
170 GOTO 43	
170 3010 40	

load each line of code from the left hand Fig 2 The Hex code column and then press Newline

00 0000			5	
ରତ୍ତର ପ୍ରତ୍ୟ ବ			4	
2000000 20004#	1.15	HL , (16395)	5	C. WE
11007D	LD	DE,32888	7	C . OP.
01D/02	LD	BC,727	8	

type te an Note nand mber

od

bl ng

e in reen

next

19 \$

wkne

ex.

570

pay l op

m by re.

r the

typ

com

000

pro t line 109

code

CO

ating

WITH

made

e w ll

ated

eing

000

ог ге nate

elete

then

eiess

den

2X81 UTILITY

EDB0 C9 0500 3E00 F5 112100 2A0C40 78	LDIR RET LD 8,0 LD 9,0 PUSH RF LD DE,33 LD HL, (16396) LO 9,8 CP 0	911234567	PRINT
23 10FD F1E004 479 10FD 0205140 0603	INC HE DUNZ, ~3 POP AF CP Ø JRZ, +4 ED B, A ACD HI, DE DUNZ, ~3 ED C, 16513 LD C, 16513	or benderbands or benderbands	
13 23 1A 77 10FA 051E 23FD 20FO	THE HE THE HE I A (DE) LD (HE) A DUNZ, -6 LD B, 30 INC HE DUNZ, -3 DEC C URNZ, -16	0570456789	
21007D ED580C40 010702 CD80	LD HL,32000 LD DE, (16396) LD BC,727 LDIR	401 423 444 444	C.DN
280040 0620 2820 282 2680 77 107 107 107 107	LDIR RET B.0 LD B.0 LD B.0 PUSHE, 33 LD B.3	44444555555555555555555555555555555555	INURT

Fig . 39 main part of the BASIC program

1 DEM
1 REM EERND) ?
NOT GOSUB TAN PY PRINT 15
FERNISO DETUCKI
EERNO? RETURN CTT CLEAR LET RE
TURN C. ?. (CLEAR TILLIDAY) ??
TURN C. ?. (CLEAR) REND 17 ? (IF 271 CLEAR \$4 LIST TAN 5 ? G OSUB ?ERND NOT GOSUB FTAN EERN
NATIONAL STATES OF THE STATES
ASOB ATHUR NOT - CORNE BLUN ESDN
SILL, A. C. SHAE A. L. MEXI TON
20 REM ARRAY A\$ (54.5.3) HAS BEEN DIMENSIONED
20 KER HARHY H\$ (54,5,3)
HAS BEEN DIMERSIONER
THE REGIES AND THE STREET FURCHIE
40 PRINT AT 21,0, "CREATE WHICH
CHARACTER?
50 INPUT CS
20 20701 0
60 IF LEN CS:1 THEN GOTO 50
70 CLS
80 IF C\$="" THEN GOTO 250
55 TU 63- 110EN GOID 526
90 GOSUB 640
100 IF CODE A#(C,1) +CODE A#(C,2
TIPODE OF CONTROL TO THE TENT OF THE TENT
) +CODE A\$ (C,3) +CODE A\$ (8,4) +CODE
HAIC, SI & THEN COTO 148
110 PRINT AT 21,0, "CHARACTER EX
LESS LESS LESS LESS LESS LESS LESS LESS
1515, RE-DEFINE? (Y)"
120 INPUT Bs
130 IF B\$()"Y" THEN GOTO 42
TOD II DAVY ; THEN GOID FE
140 CL5
150 FOR M-1 TO S 160 PRINT """", C\$, """", " LINE "
160 DETAIT HARR OF HARR A LENS A
TIME , LINE
,M," DATA? ";
170 FOR N=1 TO 3
180 INPUT D
190 LET A\$(C,M,N)=CHR\$ D
200 PRINT ALEC.M.NA:

230 PRINT 230 PRINT 230 PRINT 230 PRINT 250 REH 250 REH 250 PRINT AT 21,0,"PLOT WHICH ARROTTER? 290 INPUT C\$ 300 IF C\$*2" THEN GOTO 520 310 PRINT AT 21,0,"SEARCHING F 320 GOSUGG 640 330 LET Z 16514 340 FOR H=1 TO 3 350 FOR N=1 TO 3 350 POKE Z,CODE A\$ (C,H,N) 370 LET Z=Z+1 380 NEXT M 400 PRINT AT 21,0,"MOUE 5,6,7, CONFIRM C" 410 RAND USR 16529 420 RAND USR 16541 430 IF INKEY\$="8" AND X 29 THEN LET X=X-1 440 IF INKEY\$="8" AND X 29 THEN LET Y=Z+1 450 IF INKEY\$="8" AND Y 0 THEN LET Y=Z+1 450 IF INKEY\$="6" AND 7 (16 THE LET Y=Z+1 450 IF INKEY\$="6" AND 7 (16 THE LET Y=Z+1 450 IF INKEY\$="6" AND 7 (16 THE LET Y=Z+1 450 IF INKEY\$="6" AND 7 (16 THE LET Y=Z+1 450 IF INKEY\$="6" HEN GOTO 28 480 POKE 16542,X 490 POKE 16544,Y 500 RAND USR 16591 510 GOTO 420 520 REH 530 PRINT AT 21,0,"INUERSE UID 570 RAND USR 16529 580 PRINT AT 21,0,"EXIT PROGRAM 570 RAND USR 16529 580 PRINT AT 21,0,"EXIT PROGRAM 590 INPUT C\$ 590 INPU
500 IF C\$()"Y" THEN GOTO 280 610 510P 620 5AVE "B" 630 GOTO 30 640 LET C=CODE C\$ 10 650 IF C=182 THEN LET C=1 660 IF C -10 THEN LET C=54 670 RETURN

Fi- 4 7				_		_	_
Fig 4 7 characte	ype in ei ir, fallawi	ach of ti ad by Na	ha 15 er wline	itries you	i'll need	to creat	te each
74 11 [5	ତ ସ	@ @	@ @	8	00	Ø 0	e e
0	5	5	0	명 조	2	<u>@</u>	8
"£"	135 0	3 133	4 Ø	128 0	4 2	93	129
" \$ "	135 1	130 134	@ 130	5	50	1	9.0
@ ··	@ @	@ @	Ø . Ø	8	2	0	i.
"7"	50	3	4	1 0	3	1	5
ø`"	135 0	1 134	ତ ପ୍ର	e O	2	2	5 6
5 "	134 8	0 135	2 1	Ø Ø	5	@ 0	0
" > "	0	0	9	134	Ø	0	135

								ZX81 U	TILIT	Υ						
	1	Ø	1	0	Ø	9	ø	2		8	0 5	50	0 5	80	50	8
1	9	0	2	2	135 0	2	8	134	"K"	5	8 5	5	5 4	5 1	9	1
ı	151	4	Ø Ø	9	131	131	4	131	°, Г.,	5	9 5	0	5	0	83	5
	7	1	8	2	8	5	Ø	3 2	M.	7 5	6	50	5	5	50	5
١	3	1	8	0	8	8	0	3 0		AGE	Ø 5	5	7 S	4	5	5 2
	.28	1	1	5	134	130	2	132	. D"	ig in	3	4	55	8	5 3	5 @
	1	@ @	6	50	ම ම	133	20	135	٠, ل ـر. , , , , , , , , , , , , , , ,	7	3	4 0	5 8	€ *	50	200
	9	9	8	8	8	6	2 5	8	"G"	6 5	3 5	4 134	5	Ø	5	5
:	a'	Ø Ø	0	8	2	0 0	200	ම ම	7 P."	7	3 5	4 2	5 4	a	5 Ø	<u>;</u>
	D	6	9	20	20	0	8	8		á.	4	а Ø	5	- L'	- ح	Ø
	1	5	3 5	4	55	135	53	130	± ± · ·	3	7	15	Ø	ري م	1233 17	Ø Ø
	8	925	13ಎ	6	130	3	1	1.3	. U	5	9 5	5 0	55	9	57	0
	12"	6	3 5	4 2	Ø Ø	135	3	135	.13.1	5	20 10:1	5	<u></u>	5	5	e 2
	3"	3 4	3	50	5	52	03	, in	1 7 7 7	E,	@ 5	5	P) FI	27 3	5	i.
	133	0	5 3	132	6	8	88	5 8 8	4	€ ₽	Ø:	20	4	5 1	Ø 23	₩ 1
	5"	6	3 4	0	1010	5	3	0	e apart	50	<u>ම</u>	Of cil	134	155	1	
	"6 -	6.1	35	4 2	5	5	3	/ 0	"Z·	3	3 5	50	0	135	3	35
	1	3	3 133	50	2	235	0 0	135			dump sho	wing typi	cal chara	cters des	ugned us	ing this
	3 '8'	6	35	4 0	55	5	53	6 @	program		والجوا		٠-	0		3
	3	5	3 4	4	5	5 0	53	8	10		4) t) (Ŏ.)
	3 "5"	ŝ 7	5	0	1.0 U	1	<u> </u>	1.			'n			LI;	T	111
	3	4	3 5 3	4	ស្ត	03	53 2	6 5			لياب					11.7
	. 0	Ø	5	0	4	200	3	<u> </u>		"			.] -			
	9	5	35	40	500	3	ត្	5		14	ii		ani Deli			Žo.
	3 "E.	1	3 5	2	20	23	3 6	7	VI	ı,	١ï	4	T. T		‡ /	i,
	3	7 1	35	8	50	1	0	2	Fig 6 7		IC progra	т гединге	d to cell	this disp	alay into	a new
	5	5	35	4 0	5 5	\$ 0	3	0	16 26 36	FA	T Zs	= 3206(а то	3269	12	
	"H"	5	85	50	55	2	130	7	46	HR\$	PEER	\$ X &		THE		T 2\$3
	"I"	132 0	133	9	133	3	1	133	60							

161

C

ŦĐ.

, 6

EN

EM

69

RI

AM

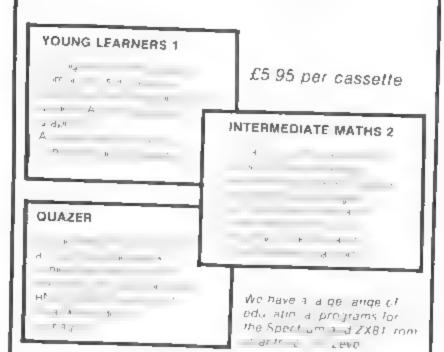
h

29



ROSE SOFTWARE **EDUCATIONAL SOFTWARE**

FOR THE SPECTRUM (16K or 48K)



Scidsautrican g. a corporist,

ROSE SOFTWARE

148 Widney Lane, Solihull, West Midlands B91 3LH.

WIN THE POOLS?

SPECTADRAW 2 - THE BEST SELLING POOLS PREDICTION PROGRAM FOR THE 48K ZX SPECTRUM

The program flooks at the recent form of the teams playing in each werk's English and 5 offish (potball league marches and then refers to a arge database to see what has happiered in he past when teams with a milar forming. By compining he lossons fearnt from the past with the learns in rent leady is position, the program general that traw is that it factor for each match it can then identify the maiches which are key to vield aws and output suitable predictions it will also imput the east likely draws for the benefit of those who wreter he fixed odds wiles on

Program 8000 match database (both on high quanty cassette) and instruction manual £12.95 inclusive

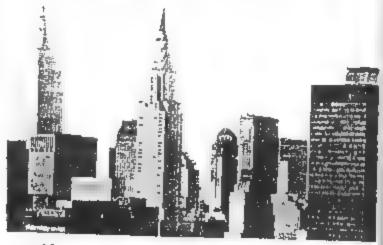
NEW!!! SPECTASORT . THE PERM GENERATION PROGRAM

Spectasorr lakes the 14 most likely and 10 feast likely draw predictions and produces fer 8 from 10 fill over perms a labing or to complete you pools a lippon rectly from the screen. The agram will also on its liwn in 16K as a Jyour liwn predictions or us the unique tea re of being able to marge with PECTADRAM 2 to provide a omplete Phots Pred from

Spectasort program on high quality cassette £4.95 inclusive (Cheques POs payable to B S McAlley

SPECTADRAW 1 Cowleaze, Chinnor, Oxford OX9 4TD

ATTACK ON NEW YORK ZX Spectrum 16K or 48K



You are alone in Central Park; your mission is to save Manhattan.

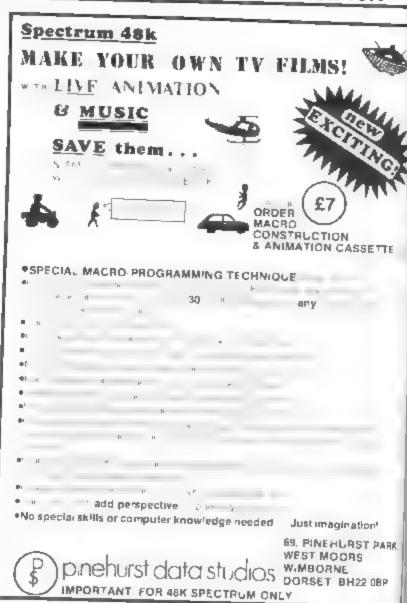
Lots of features * bonus lives * hi-score * amazing graphics.

This high quality lasse tells NOT project. and CAN her role .. STC

This alows in selvino wish observ exactly how the program insight in experimen with no alterations

Send £4.25 to. FRY 174 Heythorp Street, London SW18

STATE WHETHER 16K or 48K



Reader's reviews

More of your thoughts on the commercial software packages you buy.

This feature provides you space to air your views on any software be tifor the ZXBO ZXBO or Spectrum If you've had a good or bad experience with any of the commercial software packages available for your microliwhy not write mand tell us?

K

TTE "

3pt

PARK

1000

RY 1984

Your reviews should contain you critical thoughts about he software and the relevant details concerning the evaluability of the package, its pice etc. You should aim to produce something like 250 to 500 words per package depending of course on how enthusiastic you are about the sof ware.

Any reviews published in this section of the magazine will be rewarded with the price of the tape you review. So if you buy a cassette and send in areview which gets published your get your software for

30 Monster Maze New Generation Software John Hall

Are a four minute bading time the program auto-ran and the message. Anyone there? I asked onto the screen. After a while it said. Well press something then it pressed a tey and a man appeared on the left of the sreen and 'Roll up follows see the amazing Tyran rosaures. Rexisted up on the screen, along with instructions. I you require them.

Next the message 'the mists of time passed over comes up and after another 30 seconds the maze appears on the screen in 3D. Simple 1 thought until 1 saw the message footsteps approaching' and 1 spotted a T. Hex marching towards me It was not long before was posthumously awarded 35 points. And there I was back in the maze.

was very surprised by the gaphics they are excellent

All the walls facing you are shown as grey whereas the wall at an angle to you are colloured black in providing an extremely good 3D is mulation. And the TiRex' Every step fur ther towards you reveals more detail of the monster until only its teeth can be seen as you are using leaten alive!

As you travel down condors you see more passages to your left and right land of which you can choose to go down. The graphics of the maze alone are great, without the added bonus of the TiRex and the exit.

Ah Did I mention the exit? Yes somewhere in the maze is very complex and the exit is exitremly difficult to find. And the exit is sited in a different place each time you play the game so it since trying to remember a formerly successful route. When the exit is found, it is easily recognisable by the rings of random characters moving outwards from the centre. Quite spectacular teally?

If you are told to RJN at any time during the program then it is advisable to do so as it is possible to outrun the TRex. You can after the speed of the game easily, but be warnled it gets very difficult to play the game at the higher speeds.

When you see the words Rexies hiwait' printed up on the screen you must be very cautious. This means that the Tild Rex could literary be just round the corner.

This is definately not a game for those of a nervous disposition. But for anyone else, it is an entertaining tand highly recommended machine code game, which at £4.95 is good value for money and 'the game.

to top all the others

Astro Blaster Quicksilva Mark Stoneman

Quicks Iva have a reputation

for good quality reasonably priced original games with excellent graphics and sound. Their offerings, therefore, can expect harsh criticism for minor grievences.

It now seems the in thing in Spectrum programming to be able to fit a good game into 16K, what with Melbourne House Psion managing to get the three excellent Horace games into 16K. Quicksi valuate obviously fried to copy their competitors achievements but in doing so they have made several crucial errors, it would have been better if they had effect in 48K.

The game loads very quickly tin only 43 seconds) and hav ng done so the player is then given the option of using the Kempsion jaystick or the keyboard. Once you have selected your means of doing battle you are shown the keyboard controls regardless of the weapon chosen. They are 'S to start the game itself 6 to move your ship left 7 to move your ship right. O to fire and HI to no diffe game at any point. This is a very useful command as your trigger finger can get very tired during this very fast, non-stop arcade game incidentally the standard set of alphaber characters. s not used but a Space Age set which is rather hove.

The scene is set by an exerpt from The Book Of The Fall wan Empire' on which the game is based. Once the start button is pressed you are thrown straight into the thick of the action. You are the cyan coloured ship at the bottom of the screen but instead of the enemy being above you as is tradition, they are in front of you.

When you see the screen for the first time you witness the major disappointment for the first time. The game is set on a background of stars but in stead of them scroling from top to bottom they appear at random, which spots the effect considerably. You commence with five ships and the first obstacle is a screen of Cybirds which flap at over the screen at random dropping Plasma Boits, and are able to scrol from one side of the screen to the other de eft to right or vice versar a though you cannot

Having destroyed one screen of Cybirds you find yourself approaching a repeat of the previous screen. This completed you are thrown into the middle of a meteor storm. These red lumps of rock shuffle around randomly can cut in-

to your ship at the last moment, destroying it if you're not careful

Should you manage to sur vive the storm you are confined by a swirling 'egg like object which delivers Plasmabo ts at a great rate of knots you are well advised to stay clear of this until til hatches' Once this happens another screen of aliens appears although they are very dif ferent to the Cybirds and resemble the traditiona in Their vader much more Plasma Bolts sway from sideto side as they approach and, ike the Mereors, cut into you at the last minute. Then comes a repeat of the previous and then the Meteors. Should you manage to survive all this, a screen of Insect like allens awaits you. Their Plasma Bolts approach in the same way to thuse just encountered Altogether there are five stages and 15 levels of dif ficulty. However there are severa bad points which should be noted

- The fact that stars appear at random rather than scrol from top to bottom, as a have a ready said.
- 2) Every time you beat a set of aliens you have to survive a Meteor Storm which gets a bit tedious after a while Your success in the game largely depends on how you fare in the storms.
- There is a Hail of Fame but to enter your intrals into it you have to use the left in ght and fire buttons. You can use the start button to skill but the best score is only registered through the Hall of Fame.

The score best score and ships left are all shown on screen as well as the title and the name of the author John Edwards. The game, like all Quicksi valones is fabulously boxed and, priced at £4.95 is very reasonable indeed.

Although the game is basically an updated Space in vader. Quicksilva have tried to introduce some of their own ideas. It might be an idea to modify the above problems and make a 48K version.

Astrob aster is available from Quicksilva Ltd, 13 Palmerston Road, Southampton S01 1LL and is both enter taining and challenging I would say it is one of the best arcade games for the 16K Spectrum

Spectrum Masterchess Mikro Gen Darren Sargent

if you like playing chess, then this is the casette for you. If you don't like waiting for them, however, then perhaps you should think twice before ordering. This cassette took three weeks and several calls to Mixro Gen before it propped on my doormat.

It is unusual not to find the LOADing instructions on the insert card instead it teils you to 'LOAD in the usual way Once you have accomplished this feet indioffence. Mikro Gen, it loaded first time you are presented with an elegant graphic chess board, complete with pieces and a phainumeric abe ing. At the top left of the screen are two mysterious words 'You and Me' These turn out to be the coumn heading for the scrolling history of moves

At the bottom of the screen are the options play colour set up. Taking these niorder

Play Pressing 'pipults you into 'play mode You are asked if you would like to play black or white, and then for the level (O easy, to 9 probably hard when it eventually moves. If you decide to play black the computer will kindly reverse the board for you so that you are always playing up the creen. Once you have done at this presuming you are playing white you can key in your upening move delete the move you were about to key in, change the leve lask for a recommended move get a screen dump, save the game or go back to the play colour set up question After each move you are of fered this series of options

Colour This allows you to get the board, background text colours and what type of pieces are used in the display

Set up. This allows you to set pickess postions and then play them. You move a cursor over the board, with which you can place any piece of either side at any position on the hard. When you have set up you riposition, you can choose sides, level and brack or white to play.

This cassette is excellent value for any chass enthus ast a though the instructions say nothing about the rules of chass Even so it supports all

the usual chess moves loasting, etc., and is a worthwhile purchase at £6.95

Black Crystal Carnell Software MJ Richards

Aithough it took four weeks for the Black Crystal adventure program from Carne I to arrive it was very impressively packaged on two tapes with a large pamplet which reported the history of The Black Crystal and listed the control keys

The game was n sx parts which al loaded in the first time, a though there was a back up copy. The quality of the tape was good and there was very little hiss. decided to be a wizard the first time played the adventure.

The graphic display at least on the first map was very jerky. In several parts, particularly maps three and four the program is mainly text however, graphics play a arge part in the game. The main drawback is the speed of the graphical display which could be improved using machines code or Pasca. The keyboard reacts quickly which is important for the battles are in realtime.

Your aim is to collect seven rings of power which are hid den in the six maps. The difficulties in the maps aride from monsters in the controlled by the Lords Chaos or ones in dependant but just as mean. The game is by no means easy. The greatest difficulty arises from maps one two five and six which are most grahical, maps three and four are less graphical but by no means easy.

Despite the same plot being used in different games, the sheer quantity always means there is a ways something to see In map four the king. reacts very amusingly when he orders your death but because you are resurected by Gora now a sem God he captures you again Also, the abacus which you can pick up can never get the right answer The game is addictive because you often have to spend more than one day on one game 1 have now played several games at most enjoyable. My favourte is map six which is the shortest but at II challeng ing particularly the second evel game of ogic Because there is 180K of program in this package there is a great deal of variety.

Graphics feature largely in

the game and use of the user defined graph as is very good However, a keyboard over ay would be useful as more than 16 keys are used in some parts excluding those which required two word commands. Map one has a very impressive graph a display.

At £7.50 it is a very good buy as it includes an incredible amount of detail and it is very good quality it is highly recommendable.

Airline Cases Computer Simulations J. Whittaker

The main objective of this game is to increase your net assets of £3 million to £30 million it may sound easy but is it not because you only have seven years in which to do t

The game begins with an urgent telex lelling you that the Civi Aviation Authority has granted you a £1 million trans-Atlantic Ticence to fly DC10s from Gatwick Then you are given a bar chart estimating pay oads for these Then comes a me DC10s graph of charter rates for each quarter of the year. You must then decide on how many DC10s you wish to charter this is done from the previous pieces of information. Then, another decision must be made on evels of crew and maintenance. You must then key in the amount of insurance cover you need. This is usually followed by a disaster namely a highjack, a crash or sabotage this s why i s usually best to have ful in surance cover

As were as these things hap pening you can also decide on whether or not to sign a fuel contract with Saudi Arabians But occasionally this is un wise. Sometimes the Americans prove unfriendly claiming that you are not paying sufficient taxes.

At the end of each year you are shown a profit and loss account and then a balance sheet. Then comes a Financial Times report which tells you how well you did or didn't. A way of getting a very good Financial Times report is an investment in the form of buying a DC10 but this is only achieved when your air ine is doing well if you get a really terrible report, the recievers close in and I guidate I. Air

This is an excellent game which really tests your

business skills and in tate, but if you buy this expecting very good graph as or and acdictive game, ke. Space Raiders' you will be very disapointed.

Arlne retais at £6.95

Orbiter Silversoft Lawrence Tout

have been receiving ZX (un puting for about a year number of the puting for about a year number of the number of the seen. Silversoft's Orbin reviewed. So now I have a chance to tell the readers what a fantastic program it is

It is nearly exactly like the a cade game Defender have to trave in your ship across the hilly andscape blasting any green a ensite come across. The am o in game is to retain 10 bile to ects which le along the bo tom of the screen amongs: the landscape You are given her at the start of each game are the green aliens try to at acthemse ves to these and more towards the top of the screen The am is to first bids the alien and then catch the falling blue object before it hits the ground and s destroyed Points are given for catchings and returning it to the ground safely However f you don stop the aten and it reaches the top of the screen, it changes into a purple or out alien its movement is much more eratic and they move taster making them difficult to h t

The layout of the keys is cieverly done and they must up down thrust fire changed rection hyperspace and smart bombs if used the smart bombs desiron everything on the screen with an impressive flash.

Besides the resident alies there are also blue and purple squares which move diagonally across the screen avincimines as well as inhocuous ooking yellow saucers which never move except when her are hit, when a hoard of smaller red saucers as unleashed.

The entire activities of all be aliens are shown on a one range scanner at the top or he screen

As you progress throughous attack wave after anothe you are awarded extra ships and smart bombs—ve found that after 200 000 points the computer becomes very generous with these

One drawback with Orbiter is that you are only shown a

SOFTWARE REVIEWS

hree smart bombs on the screen, so I you have more han three it is impossible to lisap the how many more.

but of cur osity illet my ships be destroyed and found that I had 18 ships apart from those

free shown this was at about 350 000 points:

Carr

rever

biter

ive a

what

he ar

Ship

cape

f the

e ob

bot :

st the

these

e and

ittach

move

reen

t the

fall ng

s the

bayc

ung it

round

don't

aches

n, it

oued

much

move

U 1 10

YS IS

clude

nange

and

roy

w 1h

al ens

purple

gonal

laying

CUO₄5

wh ch

they

rd of

are

althe

long

of the

h one

r you

s and

that

com

erous

)rbiter

E UMO

the

The danger in this addictive game is that if the green at ens swipe a your blue objects there is a flash, the landscape disappears and from then on all he alens are automatically changed into mean purple ones. The secret to survival is not to lat any cost liet this hap. pen because if t does you're in trouble. So when down to the astiblue object instead of setting it down on the ground after taking it from the alien hold onto it for long as you do no aliens can pick t up Then you try to reach attack wave 10 where you are given we free blue objects after every attack wave

At £5.95 I think Orbiter is well worth the money

Computer Scrabble Psion David Rowley

About renivears ago i seriously considered writing a program to play Scrabble on PDP 8 However I soon realized that the program's vocabulary would be so small that it would probably and up passing on half is turns Now, Psion have produced a program with a vocabulary of over eleven housand words (yes 11,000, to the Spectrum 48K But having a large vocabulary is only part of what is needed to succeed at Scrabble, you need pisee where the letters can be placed and decide on your strategy is it really a good idea to open up the triple word square for your opponent?

So on to a description of the product as the marketing managers call ti The cassette comes in a min ature version of the box the origina game ames in so it is instantly recognizable. Inside the box is professionally produced booklet describing the game for those who are unfamiliar with t and deta s of how to operate the program. Although the program contains quite a whot instructions, these are all straight forward and easy to understand. The first trick, of course is to load the program and after a couple of failures or side A, side B loaded first me as it has done ever since

On successful loading of the program a number of questions appear

- Is your television colour or black and white press C for colour or B for black and white
- Do you wish to reload a previously saved game type Y for yes or N for no.
- 3 Number of players press 1 to 4
 - Name of player type name (max 8 letters) then ENTER
- 5 Whether this player is the computer or not type Y for yes or N for no.
- 6 If yes then at what evel do you wish the computer to play for this player press 1 to 4 where 4 sithe hardest level
- 7 Do you wish to see the computer's letter rack press Y or N
- 8 Do you want to see the computer trying its moves press Y or N

The first option - wanted was to see the computer playing against itself so opted for eve three against evel four with the options of seeing the computer's etter rack, and seeing t try ts moves Immediately on the screen was the Scrabble board with different colours representing different square values. For the player currently taking a turn the rack of letters is displayed although not after they are placed on the board. On the right of the screen are the current totals of all players, the etter racks of all players, the number of tiles remaining, and a si of options. This game was marred a little because the efters which came up on the racks were very difficult to score well with legis x vowers, or a Q and an X' at the same time However evel 4 ended up the winner by 284 to 254 What was fascinating was to see the computer trying its moves. The flashing cursor square darted at over the board, trying out potential words, and printing things like extra would score 32 Still the real test of the program

As a finalist at the British Scrabble Championships some years ago I felt quite confident set the program level 4, and asked the computer to keep its tiles hidden and not to visibly try out it moves. After scoring 32 on my first go if felt confident. But that confidence im-

was to come

med ately disappeared, for the computer placed a full word and got on a triple word square to score a total of 86. The rest of the game was superb. The tiles came up well, a some good words were placed. The final scores were 358 to the computer and 332 to me. Although I caught up towards the end of the game, to be honest I never looked like with nor.

So a victory first time out for the computer have beaten eve four since but it is not easy. I ment oned earlier that there are a number of options available. When it is a partirular player's turn these options may be chosen.

Symbol shift V dip ays the let ter tiles of all players

Symbol shift Sidisplays the values of various special value squares

Symbol shift R allows you to rearrange your ties in any way you wish

Symbolish ft. Clallows you to change any number of I les you wish

Symbol shift Jite Is the computer to relarrange the tiles in a random fashion.

Symbol shift Q abandons the game and gives you the option of saving the game or starting a new one

It is also possible to pass it you cannot place any letters

All the options available in the original game are available even knacking the board over can be accomplish ed by accidentally puling out the power ead. Placing a word on the board is much easier than though t would be You simply move the cursor to where you want the word type A if the word is to go across the board or D if it is to go down and then type the word. The computer then places the word on the board. gives you your score, and the option of changing your mind f you wish to play somwhere else instead. When you finally enter the word the computer checks to see if the words formed are present in its vocabulary if they are the game progresses, if they are not the computer asks you f you are sure about the word if you answer yes, the computer accepts t

I mentioned the importance of strategy in Scrabble and here it is worth noting that the different levels appear to have different strategies. Level one seems to make little effort to score its maximum possible each turn apparently placing

fles as soon as t finds somewhere they will go, and t has a very fast response time. By contrast leve four always seems to attempt to get the maximum score possible, with one or two exceptions leg if it has a blank it will not place it unless it gets quite a good score with it but keeps it for a later turn. Dr. Peter Turcan who Psion acknowledge as having played a large part in the development of the program, and Psion themselves are to be congratulated on this program For the beginner, evels one and two introduce you to the game, while evel three provides a pleasant respite from the excellent lay of eve four for the more experienced player. The program also appears to play an open rather than a defensive game. which is much more fun for its opponent

Are there any criticisms of the program? Only two, the first of which iam pretty sure can be solved only by using other hardware like a pen and paper or a Scrabble set. This problem arises if you wish to play against the computer and against human players at the same time. While the computer can keep its effects hid den the other human oppo-

nent cannot

Still more Scrabble enthusiasts believe that two person games are much more fun anyway.

The second cuticism is the price of 15.95. Maybe it reflects the box the program comes in maybe not but. Psion are likely to lose sales to those potential customers who have only played Scrabble a few itimes and thus not prepard to pay this much.

Overa a superb program particularly (you are a Scrab bie enthusiast without a regular opponent. But how about a price out?

The authors of any of the reviews published within this section of the magazine will reveive payment equal to the amount spent on the software reviewed unless another financial arrangement has a ready been settled on Allicon tibutors should be typed double spaced and contain any flustration you wish to see accompanying the review. You reviews should be sent to the following address.

Reader's reviews, ZX Computing, 145 Charing Cross Road

NOW. A ZX81 PUSH-BUTTON KEYBOARD FOR UNDER £10.

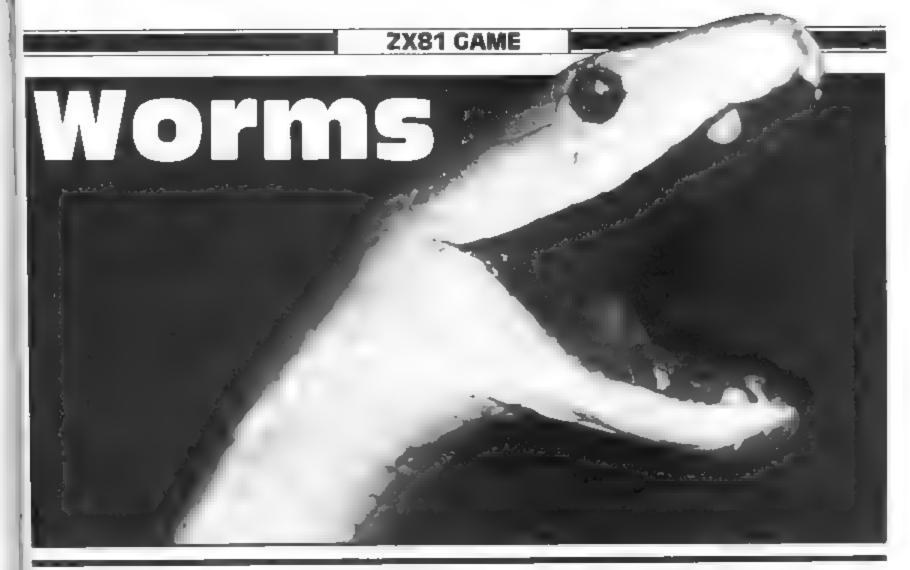


At last there's a really cheap but efficient way of ironing out the ZX81's only real bug its keyboard. The Filesixty Buttonset offers

■ A full-travel calculator type moving keyboard for only £9.95 ■ Installed in seconds. The peer off adhes we backing means you just register into position and press. ■ No messy labers, dismanting or soldering ■ 3 groups of colour keys to pick out shift, numerals and newline ■ Precision movided in ABS to match your ZX81, with contrasting legends for maximum legibility.

Filesixty Ltd. 25 Chippenham Mews, London W9 2AN England Te. 01 289 3059 Telex. 268 048 EXTLDN G 4087

Orders to Filesixty Ltd., FREEPOST, London W9 2BR. Cheques PO made payable to Filesixty Ltd. Please send the including VAF and P&P1 That Prink APPA; Name Address



Surround yourself in machine code in this great ZX81 program from Gary Nugent of Churchtown, Dublin.

his is a two player game. The abject being to force your opporient to colide with a wall your worm or your opponent sworm.

The game uses the full 24 by 32 screen, the wais being the black border around the screen one worm is made from

characters the other's made for # characters. The worms grow as you move around the screen.

Movement is in four directions up down left and right. Stys A lupi. A lifeft. Singht and Zildown controlline worm. Keys O upi. K. et a Linght and lidown controlline worm. A worm skilled if it hits a war bits the coppnent s worm collides with itself or moves back on itself. The game also has on-screen storing to both players. Key Freturns control to BASIC and itops the program.

Down the line

boking at the main program. The machine code is held in the inel REM statement containing haz characters. There is an easy way and a hard way to reate such a REM statement. The hard way is to type in the 532 characters one after nother. The easy way is as

follows create the REM statement in Fig. 1, that is, a REM followed by 100 characters. Edit the line numbers to form lines 2 to 5 and then enter line 6 a REM followed by two characters) as in Fig. 2. Next, execute the following as direct commands.

POKE 16510 O (this ensures) the line cannot be edited? POKE 16511 22 POKE 16512 2

A REM containing 532 chara ters has now been created and the machine code program can now be entered using a nex loader like that in Fig. 3. Incidentally PRINT PEEK 16511 + 2h6 * PEEK 16512 2 does not give the answer 532 then you have typed in the REMs wrongly, and you should go through the above procedure again.

After you have entered the machine code program, you can check to see if you have entered it correctly, using the program in Fig. 4. When you are sure you have entered the machine code program correctly, you can now enter the BASIC control program. Save the program first by RUN. 200 pust in case something goes wrong.

Too fast?

To murease the speed of the game type in the following as direct commands.

POKE 16912 X (Where X is a value between zero and 255). The lower the value lithe faster the game). POKE 16913 O. To slow the game down type in the following.

POKE 16912 X. Where X lies between zero and 255. The greater the value the sower the game .

POKE 16913 Y + 1 or 2 is

POKE 16913 Y + 1 or 2 is usually a big enough value for Y

I you would like to change the characters which form the worms then to change the + by typing in the following

POKE 16838,C POKE 16797 C + 128 Inverse of C) POKE 16870,C POKE 16880 C POKE 16905,C

where C is the code of theire quired character

To change the '*' worm type in the following

POKE 16850 C POKE 16875 C POKE 16900 C POKE 16910 C POKE 16813 C + 128

The program is published with originally written for a ZX81 arthough with the tion of all the bit of machine at will run on a machine which has 3K of RAM is where he display the is not automatically filled with spaces. To make the program run in 3K, the machine code should be praced in a line 2 REM statement.

LD H. 4022	21 22 40
LD (HL),00	36 00
LD A 00	3E 00
LDC 18	OE 18
LD B 20 NEXTLN	06 20
RST 16 NEXTCHR	D7
DUNZ NEXTCHR	10 FD
DEC C	0D
JR NZ NEXTLN	20 FB
RET	(9

You should also insert this ine in the program

9 RAND JSR 17053

The code creates a 24 by 32 display line whit is automatically set up on machines which have more than 3 % KRAM

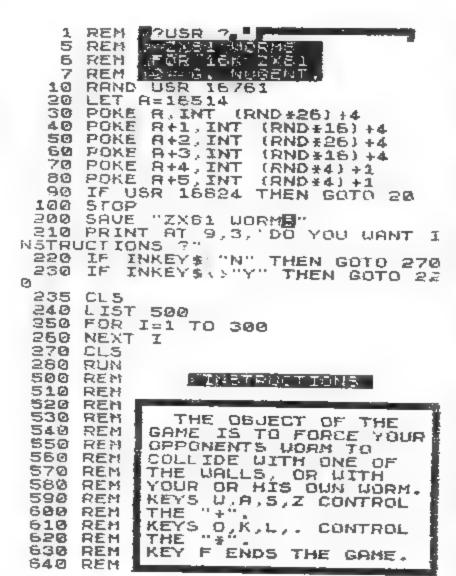


Fig 1 The BASIC control program which calls the machine code routine

6 REM XX

Fig.2

À

R

C

F

10 LET X 18514
20 LET AS = "
30 IF AS = " THEN NPLT AS
40 IF AS 'S' THEN STOP
50 PRINT AS (TO 2)," ",
60 POKE X 16*CODE AS+ CODE AS(2):476
70 LET X X+1
80 LET AS AS(3 TO ,
90 GOTO 30

Fig 3

100 FOR 16514 TO 17045 110 LET A PEEK I 120 LET B INT A 16 130 LET C A 16 * B 140 PRINT TAB 8. CHR

' CHRS(8+28 CHRs C+28)

Fig. 4.

DATA 00 00 00 00 00 03 03 03 03 03 05 06 00 00 00 05 07 35 00 00 00 00 00 00 00 00 00 00 00 00 00	80 00 00 07 03 03 03 03 63 03 84 76 00 00 00 00 00 00 24 10 00 30 34 37 00 00 00 00 00 00 83 83 63 63 83	RET LD BC FFFF PAU DEC BC LOO LD A.B OR C	SE 01FFFF P5 0B 78 B1
DATA 75 DATA 76 DATA 80 00 00 36 37 26 20 36 00 33 3A DATA 76	00 00 00 28 34 35 20 39 00 20 25 37 20 29 33 39 75	LD HL (D-FILE) CLE LD DE 90023 ADD HL DE LD C, 16 LB B, 1E LOO!	AR 2A0C40 112300 19 0E16 P7 061E
0878 60 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 33 2A 00 1D 25 24 80 80 80 80 80 80 80 80 80 80 80 80 80	RET LOOPS RET LOOPS RET LOOPS RND LOOPS RND RND RND RND RND RND RND RND RND RND	96 183 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6

	LD 8,00 ADD HL.6C		0500 09	UP 7.500RE1 LD (HL).15 LD HL,(4064)	*	CA8042 3615 2A3440
	RET LD BC,0021 CP 01 UR NZ,5TEP1	MOVE	C9 912100 FE91 2002	LD 8, (4087) CRLL MOUE LD (4084), HL		3 93740 CD4 E41 22 8440
ı	INC HL		23	D A, (HL)		<i>7</i> E FE8 0 028642
۱	OP 02 JR NZ.STEP2 DEC HL	STEP1	FE02 2002 28	JP NC,SCORE2 CP 17 JP Z,SCORE2		FE1 <i>?</i> CA3642
۱	RET	STEP2	cg Fees	P 15 JP Z.SCORE2		FE15 CA8B42
1	JR NZ.STEP3		98 5695	LD (HL) .17		3617 11 0001 D5
ı	BET BC HL.BC	STEP3	C9 ED42	PUSH DE CALL KSCAN LD B.H	SERRON	CD8802
l	RET LD A, (HL)	INCSC	69 76	2000.0		4D 51
H	OF 90 OR NZ,STEP4		2002 2002	INC D		14 3 E90
1	INC A	STEP4	3E9C	JR Z.NOCHR		2855 CDBD07
ı	OR NE STEPS		FER6 2005 3690	ALL FINDOHR D A, (HL) PP 30		7E FE3C
ı	LD (HE) .90 DEC HE LR LOOPS		28 18EF	UR NZ.CHAR1 LD R.04		3604 3604
1	D (HL),A	STEPS	77 C9	OP 34	CHAR1	1841 FE34 2004
ı	CALL BORDER		CDF740 010888	UR NZ.CHAR2 ED A.04 UR DIR2		3E04 183E
ij	CALL PRINT AT C HL,4088		CDF508 218840	CP 3F JR NZ,CHARS	CHAR2	FE3F 2004
1	P EA THET	L00P9	7E FEFF 2804	LD A.03 JR DIR1		3E03 1831
	14 Z STEP8		23	CP 18 JR NZ,CHAR4	CHARS	FE 18 2004
į	INC HL IR LOOPS LE 0,03	STEPS	18F7	LD A,03 JR DIR2	CHAR4	3503 1825 FE26
ı		1 00040	CO 4 D 4 4	CP 26 JR NZ,CHAR5 LD A,02	CHHKA	2884 3E02
i	JR NZ, LOOP 10		20FA 019400	JR DÍRÍ CP 30	CHARS	1621 FE30
	THEE PRINT-HT		CDF508 3E95	UR NZ.CHAR6		2884 3E82
	15 A, 94		3 É94	JR DIR2 JP 36	CHARE	131E FE38
	10 A.9C		3E90	JR NZ,CHAR?		2004 3501 1811
	CALL PRUSE SEC D JR NZ, LOOP10 LL BC. 0004 TALL PRINT - HT LO A, 95 AST 16 LD A, 94 PST 16 RST 16 RST 16 RST 16 RST 16 RST 16 RST 16		97 97	JR DÍR1 CP 31 JR NZ,CHAR6	CHAR 7	
	LD C.15 CALL PRINT AT		0E16 CDF508	LO A Ø1 JR DIR		36 01 18 06
	15 A 97 85T_16		3E97 D7	CP 26 UR NZ.NOCHR	CHARS	20 0 D
	25T 16		97 3E90	JR NOCHR	D.T.D.1	010000 18 08 328640
	AST 16		D7 D7	LD (4066), A UR NOCHA LD (4087), A	DIRE	1803
	RET 16		D 7	POP DE DEC DE	NOCHR	D1
	LD BC (4082)		CD2241 ED4B8240 CD3941	LD R,D		78 63
	LD (4082) .HL		228240 3515 ED486448 CD3941 226440	JR NZ.SEARCH LD A.C		79 FE90
	10 BC (4064)		E0486448 C03941	CP 00 RET Z JP NEXTGO		C8 C3D341
	D (HL) .17	NE (T.0)	228449 3617	LD DE,0016	SCORE 1	111866
	LC 8, (4086)		398640	CALL INCSC		19 CD6641 C9
	10 (4052), HL 10 A, (HL) 10 BO 10 NC.SCORE1 10 15		22924 0 7E	RET LD H, (D-FILE) LD DE, 0009	SCORE2	2A0C40
	LP NC . SCORE 1		FE80 D28042	ADD HL, DE CALL INCSC		19 CD5641
	OP 15 JP Z.SCORE1 OP 1/		FE15 CA8042 FE17	RET		C9
	1 0 10					_

40

ıg 2

ig 3

ig 4

At last!

MASTER MACHINE CODE on your Spectrum



MASTERING MACHINE CODE ON YOUR ZX SPECTRUM Toni Baker £9 95

This 1,5 page book is designed of each you the essential elements of programming in machine code Writter by Ton Baker authorio. the raythy somessful Mastering Machane lode is the 7X8 list new book assumes absolutely no previous Kr., wiedge c. machine. lode whatspever and yet promises to take your laneveof profirmently beyond your whidest dreams. Starting with simple addition and subtraction you he slow y guided through the on resubject of maurane

nute. The book explores and utuses the incredible speed of machine hode ig ving you real time. graphics games, ke BREAKOUT and leads you up to a his working DRATT aHTS program. Among other useful sky s you adopt he the abouty to breate music in real time Empossible in RAS C" and to piot in high resolution graphics laster than you would have believed possible

SPECTRUM MACHINE CODE MADE EASY

Volume One James Walsh Volume Two Paul Holmes

These two books provide a graduated course in machine code programming on the ZX Spectrum. Book one start: off with he basic concepts or machine rode followed by an explanation of Jinary maths hexadecima, and base conversion. reading as guickly and painlessly as possible onto the rules and types of addressing the Spectrum's



powert. ZRI mikirupro essur Book two is designed (cir. hose who already understand the "Laiments of machine code programming and now wish o догензе their skills

Each book is just £5 95.





THE SPECTRUM MACHINE CODE REFERENCE GUIDE Microdrive Interface 1 and ROM Disassembly

Richard Ross Langley £4 95 This . 7 pube reference work or Spectrum machune ode firogrammers confusion his asassemit you he pectrum HOM with details of the Microdrive and rientane i Features in the disassembler are ade. Zang mnemoras are

used egul A H. Instead & MOVA M relative timps show the signed decimal of set and the result, hex values are detaurt and are pricted without suffix decursa, values are preceded by a pus or minus sign, and some restart distructions are tollowed by data hytes. The absolute addresses of all system variables and vevera mountain routines have been named using where possible he standard names silk woiln the manual. The inapter headings in the Microdrive 1 temade is section of the book in our he Ro2 to intertant Mint of versham er data Local Area Network, Network Algorithms, System. Variables, and a summary of functions. This book is a must reference work for serious Spectrum machine code programmers

Interface Publications, Dept YC 44 46 Earls Court Road, London W8 6EJ

Please seniit me he billowalin books lienninse £

□ Mastering Machine Indo in your ZA Spector in Toni Baker £9.95

apperfrum Mairlane ode Made Lasy viu me victor feguners interes Waish £5.95

D Spectrum Machine Inde Made Basy inclume Two for advanced proxytammers. Fac. 1 lines 15.95.

The Spectrum Machine Code Rotors for mide.

Pirthar t Hoss Langiev 14 95

Creatury Adventures in your ZX Spectrum Fieter shaw a.u.
Tames Morseman 1495

D Putting Your Spectrum to Work Includes in major programs including a word processor and spread steet calculations

Chris Callender 14 95 Treating Arcade sames in the ZX opening Transport Haywood £3 95

☐ Programming Your /X Spectrum Hartness Jones £6.95 6) Games and Applications for the ZX Spectrup. David Harwood \$4.95

□ Beyond Sumple BASIC Derving Deeper into your ZX Spectrum. Dawyo lones 17 95

Dissian Specific mithograms by rape indibnuk. Tum Hartries £4 95

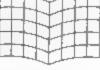
170 Survive Electronial Projects of the centrum epitien Adapts 16 45

Disast Sock of Computer values for Hildrer 1795

Name

Address





Au books available from computer and book stores, including Wilh Smiths. Menzies, and Dixons Trade supplied by The Computer Bookshop 30 Lincoln Road Otton Birmingham Bz 6PA '02, 707 7544 lefex 1.1436

Software selection

If you're looking for software for your ZX Spectrum computer, look no further than our comprehensive checklists.

What with Christmas coming up na matter of weeks you! no doubt have thought of teating yourself to the odd software package for your ZX Spectrum Weil I you've had a brief look through the adverts in the various computer magazines, you I have discovered a weath of soft ware for you to choose from

In this feature, un update of a checkist first published in the Apri May issue of the ZX Computing we have gathered logether a comprehensive selection of titles currently help you further you will also find the type of program, either Came G. Business (B Damestic D., Utility (U) or

Educationa (E) the company you should contact and the price of the cassette. At the back of the istings you will find a list of a lithe companies mentioned complete with an address at which further enquires can be made

Apologies

f you supply software casset tes and you do not find your products mentioned in these lists please write to ZX Comput ng, marked for special at available on the market. To liention of the Editor, and when t comes around to updating this feature for a future issue we will be able to include your software fit es

Spectrum Software

3D Ant Attack	G	Quickstiva	48K	£6.95
3D Combat Zone	G	Art c	48K	£5.95
3D Mazenture	G.	Softek	48K	£3 95
3D Quadrac ube	G	Artic	16 48K	16 95
3D Strategy	G	Quicksilva	16K	16 95
3D Strategy	G	Supersoft	16 48K	£4 95
3D Tarm	G	dK trunics	15 48K	(4 95
30 Turnei	G	New Gene at on	16 48K	£4 95
30 vortex	G	JK Greye	16 48K	£6 95
A B.C	E	Art c	48K	[6 95
a,b.c wift-gff	E	congrian Software	16 48K	E 7 95
Accountant	B	Sigma	48K	£6 00
Accounts Spectrum	В	Hestac est	48K	125 00
Adaing & Subtracting	E	Widger Software	6,48K	E5 25
Address Manager	D	Oxford Computer		
		Publishing	6 48K	£ # 8 8
Adventure	Ģ	Abersoft	48K	1995
Adventuse	G	D. Mondy	16K	£5 00
Adventure 2	G	D Moudy	16K	£5.00
Adventure 3	G	D J Moody	16K	€5 00
Adventure 4	Ģ	D . Mondy	16K	05 00
Adver ure 200	C	Forkade	16K	£5 95
Adventure (sland	G	Cont ast Software	48K	£4 95
Adventure Quest	G	Leve 9	48K	£9 90
Ah Diddums	G	Imagine Software	6 48K	65 50
An Traffic Control	G	Hewson Consultants	6 48K	£7.95
Aidine	G	Cases Computer		
		Simulations	166	E5 00
Ailer	G	Spec e Soft	1.6K	£3 95
Alter Command	G	Microwa e	16K	£4 75
Aler Maze	G	Compute Rentals	48K	f5 95
Aler Mine	G	E Applications utd	1 BK	£4 99
Ner Swarm	G	Titan Software	1 EK	£4.95
All-Sort S	· ·	A an Firminger	48K	69 95
		_		

Alabahan	Ε	Middle S. F. Harrison	40 404	
Alphabet		Widget Software	16.48K	E5 25
Android Ohe	C	Vortex Software	16 4BK	(5.95
Androids	G	Solarsoft	16.48K	£5 95
Angle	E	Chalksoft	48K	£11 25
Angles	Ë	AVC Software	16K	£300
	_			
Apocalypsa	G	Red Shift	48K	£9 95
Aquepiane	G	Quickstiva	48K	£6 95
Aguarius	G	Bug Byte	16 48K	€5 95
Arcade Pack 1	G			
	_	Ohmega Electronics	16K	6482
Arcadia	G	Imagine Software	16 48K	65 50
Armageddon	G	Silversoft	16 48K	£5 95
Aspect Assembler		Bug Byte	6 48K	00 00
Assembler	7	Artic	48K	19 95
Assembler/Dreassemble	~	Hewson Consultants	16 48K	£8 95
Associative Database				
System	D	Documedus	16K	013 95
	_			
Asteroids	G	Abbex Electronics	16%	65 95
Astro Scramble	G	C Tech	16 48K	£2 95
Astrobiaster	G	Quicksiiva	16K	£4 95
				_
Astron	-	dK tranics	16.48K	£9 95
Aroms	C	Cornhiti	16K	E 5 50
Audio Sonics	L.	Work Fo ce	16 48K	£4 89
Autochef	Ö	Cases Computer	4	N - 00
Actorner			4.014	
		Sim dations	16K	£5 00
Automoropoi	Ġ	Automata	48K	€6 00
A		Al	264	64.06
Avenger	G	Abacus Electronics	16K	€4 96
Awan	G	Forkade	16.4BK	65 95
Backgammon	G	Microware	16K	£5 00
Backgammon	G	Hewson Consultants	1 6 K	£5 95
Backgammor	Ģ	PSIDE	18 48K	£5 95
Ball by Ban	Ġ	Video Software	16 48K	£5 95
Bank Account System	B	Ku Gouldstone	48K	£3 00
Base invader	Ç	Work Force	16 48K	£4 50
Batt & Of Botain	-C	MIS	48K	65.95
	E	BD Software	16K	16 50
Ber Ringing				
Bit Byte Rotation	₩.	Cornhill	166	64 50
Bio hythms	D	Cr	16K	66 95
	G	Carnel Software	48K	£7.50
Black Crysta	_			
Black Hore	G	Quest	16 48K	€5.5Ω
Black Planer	6	Phipps Associates	48K	£5 95
fill ad Allev	G		16 48K	
	-	Splarsoft		
Big March Soccer	G	√Yınters	6 48K	£5 50
Brain Darriage	G	Silversoft	16.48K	€5 96
Brainstorm	Ğ	Micromega	6K	14 95
Bieakaway	G	Prucam	16 48K	65 95
Breaker	G	Wizard	48K	£3 50
Bridge	_	ZX SAS	6 48K	£6 50
Bridge Master	G	Br dgemaster	16 48K	124 95
Birnish Low and	G	Cases Computer		
		Simulations	48K	£6 00
		\$11.01B.10112	4614	+000
Borr ber	C	Lamesoft	16K	€ 2 95
Bugaboo	G	Quickaliva	48K	16 95
	В		16 48K	68 75
Business Bank Account		Fransfo m	10 45K	[0.3
Business Model Modeller X	В	Cases Computer		
		Simulations	16K	68 00
B B	8		16 48K	E 25 00
Business Pack		Tansform	10 401	12500
₽yte	G	Cases Computer		
		Simulations	48K	£5 00
Cabman	G	Micro Power	1 BK	£3 95
			2,114	1000
Cameiot	G	Cases Computer		
		Simulations	48K	£5 00
Car Race	G	Winters	16 48K	€3 95
Cashcaic	В	Wizard Supersoft	48K	£6 95
	_			
Cassette 1	G	R Bhattachara	16 48%	65 50
Cassette 2	G	R Bhattachera	16 48K	£5 60
Casserte 3	G	A Shauachara	16 48K	05.50
Cassane A	G	Onwin Software	16 48k	65 00
Castle Colditz	G	Fei x Software	48K	£5 95
Cent Bug	G	dK tronics	16.48K	£4 95
_				
Centipeda	G	dK tronics	16 48K	64 95
Cen ropods	G	Rabbit Software	6 48K	65 99
Championship Darts	G	Shadow Software	16.48K	05 50
	D	Procom	16.48K	E9 95
Characte Designer				
Chequered Flag		Sinclair Research	48K	16.95
Chemistry	G			
	E	Think Tank	4BK	66 50
	E			
Chess	E G	Mikro Gen	48K	E 6 90
Chess	E		48K 4BK	£6 90 £9 45
	E G	Mikro Gen	48K	E 6 90
Chess I	E G G	Mikro Gen Artic Artic	48K 48K 48K	£6 90 £9 45 €9 95
Chess I Chess Player	E G G G G	Mikro Gen Artic Artic Quicksi va	48K 48K 48K 48K	£6 90 £9 45 €9 95 £6 95
Chess I	E G G G G G	Mikro Gen Artic Artic Quicksi va Artic	48K 48K 48K 48K 16 48K	£6 90 £9 45 £9 95 £6 95 £6 95
Chess I Chess Player	E G G G G	Mikro Gen Artic Artic Quicksi va	48K 48K 48K 48K	£6 90 £9 45 €9 95 £6 95
Chess I Chess Player Chess Tutor Chucke Egg	E G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software	48K 48K 48K 48K 16 48K 18 48K	£6 90 £9 45 £9 95 £6 95 £6 95 £6 90
Chess Chess Chess Player Chess Tutor Chuckle Egg City	£ G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus	48K 48K 48K 48K 16 48K 18 48K	6 90 6 9 4 5 6 9 9 5 6 9 5 6 9 5 4 6 9 0 6 7 9 5
Chese Chess I Chess Player Chess Tutor Chuckle Egg City Clone	# G G G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software	48K 48K 48K 48K 16 48K 18 48K 48K 16/48K	E6 90 E9 45 E9 95 E6 95 E6 95 ±6 90 £7 95 E5 00
Chess Chess Chess Player Chess Tutor Chuckle Egg City	£ G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus	48K 48K 48K 48K 16 48K 18 48K	6 90 6 9 4 5 6 9 9 5 6 9 5 6 9 5 4 6 9 0 6 7 9 5
Chess Chess I Chess Player Chess Tutor Chuckle Egg City Clone Club Record Collector	# G G G G G G G G G G G G G G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus Work Force ICL	48K 48K 48K 48K 16 48K 18 48K 48K 16/48K 48K	E6 90 E9 45 E9 95 E6 95 E6 95 E6 90 E7 95 E5 00 E9 96
Chese Chess 1 Chess Player Chess Tutor Chuckle Egg City Clone Club Record Collector Collector s Pack		Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus Work Force ICL	48K 48K 48K 48K 16 48K 18 48K 48K 48K 48K 48K	E6 90 E9 45 E9 95 E6 95 E6 95 E6 90 E7 95 E5 00 E9 95
Chese Chess I Chess Player Chess Tutor Chuckle Egg City Clone Club Record Collector Collector's Pack Colossa: Adventure	# G G G G G G G G G G G G G G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus Work Force ICL ICL Level 9	48K 48K 48K 16 48K 18 48K 48K 48K 48K 48K 48K	E6 90 E9 45 E9 95 E6 95 E6 95 E8 90 E7 95 E5 00 E9 95 E9 95
Chese Chess 1 Chess Player Chess Tutor Chuckle Egg City Clone Club Record Collector Collector s Pack		Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus Work Force ICL	48K 48K 48K 48K 16 48K 18 48K 48K 48K 48K 48K	E6 90 E9 45 E9 95 E6 95 E6 95 E6 90 E7 95 E5 00 E9 95
Chese Chess I Chess Player Chess Tutor Chuckle Egg City Clone Club Record Collector Collector's Pack Colossa: Adventure	# G G G G G G G G G G G G G G G G G G G	Mikro Gen Artic Artic Quicksi va Artic A&F Software Docimodus Work Force ICL ICL Level 9	48K 48K 48K 16 48K 18 48K 48K 48K 48K 48K 48K	E6 90 E9 45 E9 95 E6 95 E6 95 E8 90 E7 95 E5 00 E9 95 E9 95

SOFTWARE CHECKLIST

Campiler	_	Softek	48K	£14 95	Fortune	D	AVC Softwale	6K	13
Composer	0	Contrast Software	48K 16 48K	£5 95 {4 95	French Four Rules of Number	E	AVC Softwale Micro Masier	16K 6.48K	(1 2
Computile Computer Scrabble	G	Palabu	48K	C15 95	French Vocabulary Test	E	Tutona Software	6 4BK	£3
Conflict	G	Marrach Games	48K	£11 95	Frenzy	G	Quickstiva	16%	£4:
Caak e	G	imagine	16 48K	£5.50	Froggy	C ₂	DJL Softwale	6 48K	£5:
Ca n Cropper	G	Cases Compute			Front Machine	G	Haven Hardwale	16K	14
		Simulations	16 48K	£6 00	Fruit Machine	G	dK flonics	16 48K	14 £4
Co-pign	В	Understanding .1d	48K	£12 00 £6 95	Fing/Showdown	G	Artic A&F Softwale	+6 48K 48k	14
Comdors of Genon Cosmic Debris	G G	New Generation Artic	48K 48K	£4 95	Flogger Fruita	G	Wizard	48K	16
Cosmic Guernia	G	Crystal Computing	18K	£ 5 9 5	Galaxian	Ğ	Art c	168	£3
Cosmic Raiders	G	Mikra Gen	15K	£5.95	Galactic Patros	G	Computer Rentals	6 48k	{5
Cosmic Swarm	G	Saftek	16.48K	£5 95	Galaxian 5	G	Abbex E Gut imics	15 48K	F 5
Cosmos	G	Abbex Electronics	16K	£4 95	Caraxy Arrack	G	Solarson	ABK	. 5
Countabout	E	Longman Software	16 48K	£795	Galaxy Conflict	6	Marrech Games	48K	£ 5
Count dawn	E	AVC Software	16K 15 48K	£5 25	Galleons Came of Cricket	G	Wiza d Micromo	48K 16K	[4
Counting Countries of the World	6	Widget Softwala Hewson Consultants	16 48K	£5 95	Came of Logic	6	N Darwood	1 5 K	8
C azy Ballouns	G	A&F Software	16K	[5 75	t are be toget		7 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		
Cisepy Crawler	Gi	Mikro Gen	16K	£5 95				The same	
Crevasse Ho foor	G	Microspheie	16K	€4 95	ANOTHER WHERT	57		-	
Cricket	G	Tu Owen	48K	£6 95	ANOTHE GAM	A .		100	
Crcket	G	Cambridge	40.404	6 4 0 5	The State of the S	•			-
Callen Back Assess	0	Microcomputer	16 48K 48K	£4 95	ANOTHER WHEN		12	mark to	
Critical Path Analysis Cruise Attack	e G	Hilderbay Mikro Gen	48K	£6 90	in.		34		
Cruising on Broadway	G	Sola soft	16K	£4 95	THE				
Cut you heating bills	U	Brane Software	48K	£7 95	AC.				
Cyber Rats	G	Silversoft	15 48K	15 95	ANOTHER WHERT CHESS GAME CHESS TE 488 FORT RICH SPECT RICH SPECT RICH SPECT RICH	Tipe.	V	rain.	
Cycle Planne	D	Medidata	48K	€7 25	.70		का वर्	Valle	
Cyrus is Chess	G	Psion C	4BK	£9 95	A STATE OF THE STA	10	47.50	3"	
Dallas	C	Cases Computer	164	11.00	· 《图》	1/10	19.3	4)
Database	D	Simula ions Buffer	16K 16K	£5 00 £4 50	13. 15.	11/4	A John D	CV	
Dalabase Dalahda	G	Mikro Gen	48K	£6 90	200		1		
Data Base	_	Gemin	16 48K	[19 85					
Derby Day	C	Computer Rentals	48K	£5 95					3
Destroyers	G	impact Softwale	16 48K	£6 50					
Destroyer	C	Winters	16 48K	£3 95					
Dev 5 of the Deep	C	Richard Shepherd	4 B K	16 50	Games 4 Games Designer	C	C:	16K 48K	(4 !
Devi s Reverge	G	√Vork Fo ce	48k 16 48K	£4 50	Games Designer Games Pack 1	G	Quicks) va Abacus Electronics	6K	[4]
Devpac 2 Dictator	G	Hispft dK I phics	16 48K	£4 95	Games Pack 2	G	Abacus E act onics	6K	E 11 1
Dietron	D	Cus omdata	48K	£4 75	Games Pack One	G	Logic Systems	16K	. 4 !
Digital X Word Compiler	G	N Darwood	16K	£ 6 00	Games Tape 1	C	Sospan Soft	6K	E 3 !
Display	3	Work Force	16 4BK	E 7 00	Games Tape 2		Sospan Soft	6 K	EBS
Distron	U	dK 1 onics	16 48K	€4 95	Games Tape 3	C	Sospan Soft	16K	3.3
Dominaes	G	Micromega	16K	£4 95	Games Tape 3	G	P58	6k 48K	169
Do not pass go	6	Work Force	48K	£6 95 £5 50	General Election Geography 1	G	Bug Byre ICL	48% 6%	169
Doom Bugs Dr Bongo's Safa Park	G G	Work Force Custom Software	6 48K	E4 95	Geometry	E	Rose Cassettes	6 4Bk	149
Diagon Adventure	G	Leve 9	48K	£9 90	Getset	E	G. Han & George	48K	€ 5
Dragon s Lair	Ğ	Soltek	48K	£5 95	Gnasher	C	RGR Software	68	645
Ed for Assembler	U	Pictoresque	16 48K	E8 50	Gobbieman	-	Artic	6K	E 3 5
Educational Quiz	E	Rose Cassettes	48K	£4 50	Gold	C .	Hilderbay	48K	- B C
Egg Farm	G	Lasersound	16.4BK	£6 95	Gold Mine	G	dK 1 oracs	16.48K	.53
E He Tower	6	Chalksoft	48K	£9 25 £5 95	Go f Go f	G G	Computer Rentals Vilgin	48K 6.4BK	679
Electronics	E G	Spactre ICL	48K	E4 95	Go!	G	R&R Sphiware	16K	£37
Embassy Assaul English Language	Ė	Sulis	16 4BK	£795	Go han	G	C Tech	16 4BK	.50
English Literature	£	(.	16K	£6 95	Gargan	G	Phipps Associates	4BK	149
Enigma	Ğ	Work Force	4BK	15 95	Gran	G	Severn Software	6 48k	€4.9
Equations and Inequalities	E	Rose Cassettes	16 48K	€4 95	Graph	E	AvC Software	6K	[4]
Escape	G	New Generation S.W.	6K	£4 95	Graph	L	Spectre 5oft	16K	145
Escape MCP	Ç	Rabbit Software	16.48K	ES 99	Graph Platter	D	Sigma TanGrooth Software	48K	£90
Espionage sland	C.	Artic Abbex Electronics	48K 16K	£6 95 £5 95	Graph Plotter Graphics Creator	L L	TopGraph Software	16K 16K	624
ETX Everest Ascent	G	Richard Shepherd	16.48K	£5 95	Graphics Creator Great Britain Ltd	G	S W Hasse	48K	1 4 3
Evolution	G	Microsphere	48K	£6 85	Greedy Guich	C	Phipps Associates	48K	_4 9
Exterminators	G	Silversoft	16.48K	15 95	Gr drunner	G	Quicksilva	16 48K	£69
Falls of Sharor	G	Emprise Software	48K	£5 00	Ground Attack	G	Silversof	16 48k	£59
Family Learning 1	E	Calpac	48K	£ 7 50	Ground Force Zero	G	Tian	15 48K	150
Family Learning 2	E	Calpac	4BK	1750	Gulpman	G	Cambell Systems	16K	65 9
Family Learning 3	E	Calpac	48k	£750	Gulpman	G	Micromega	16K 16 48K	E49
Farmer	G	Cases Computer Simulations	16K	£5 00	Gun Law Halls of the Things	G	Vortex Softwale Clystal Computing	48K	. b 5
laust s Folly	G	Abbex Electronics	16K	£5 95	Hāngmān	G	Specire Soft	16K	.49
rigato	D	Saxon	48K	£14 95	Hangperson	Ē	AVC Software	16k	E 3 Q
Frebirds	Ğ	Softek	16 48K	£5 95	Hano King	G	Contrast Software	48K	€4.9
Firework Music	D	Software Corrage	16.48K	£5 00	Ha. d Cheese	G	dK tipnics	16 48K	149
Flexicaic	В	Saxon Computing	48K	£9 95	Harrier	G	Abbex Electronics	16K	159
Flight Simulation	G	Paign	48K	£ 7 95	Maunted House	G	Quarrec	6 48K	£6 9
	G	Winters	16 48K	£5 50	Headbanger	G	Abbex Electionics	48K 18K	_ d
Footbali	Pa	Hardy Clause A				E ==	AND PROPERTY OF THE PARTY OF TH	1 PH III.	103
Football Football Analysis	D	Holly Products Addictive Cames	1 BK		High Noon				
Football Footbal Analysis Footbal Manager	G	Addictive Games	48K	€7 95	Migh Noon	G	Work force	6 4dK	£4 50
Football Football Analysis		-							

	_		SOFI	WAKE	CHECKLIST		_		
lume Audi lumts	D	Gemr	16 48K	£19.95	Magic Ca de	G	Carohil	6K	£35
lome Budget	₽	Flowchart Ltd	16K	65 00	Magic Mountain	C	Phipps Associates	48K	£59
lorace and the Spiders	G	Pston	16 48K	65 95	Mading List	P	Gemo	16.4BK	£199
lorace Goes Skirting	G	Psion	16 48K	£5 95	Mailing L st	B	SD Micro Systems	48K	£ 7.5
lorse Racing Analysis	D	Holly Products	16K	£ 15 00	Mailist	D	MOR	48K	£4.5
or Dog Spotter	E	Longman Software	16 4BK	F 7 95	Mancata	C	Haver Hardware	16K	£5.9
ingry Horace	G	P5iQP	16 4BK	65 95	Manic Minet	G	Bug Byte	48K	£59
den (Must	E	Stell Software	16K	15.95	Map of uk	P	Kuma	48K	(119
nua Cui se	G	Art c	48K	16 95	Masterchess	Ç	Mik o Gen	48K	169
nuome Tax	D	ZX SAS	16 48K	16 50	Maste file	D	Camuel Systems	48K	£150
idea 'Retrieval System	Ð	ZX SAS	16 48K	£4 50	Maste file 16	D	Camber Systems	16K	£89
nfrared		ACS Software	6 48K	E 6 75	Maths	Е	ZX SAS	6 48K	£8 C
ากอา เลกเอ	G	5 W Hessel 5 W	48K	[5 95	Matrx	G	dK f ones	16 4BK	£49
nkas	É	Chairsoft	6K	65.95	Matrix Operations	E	University Scitiva e	16 4Bk	£6.9
ntegration	F	Chiversity Software	6 4 B K	£6 95	Maza Chase	G	Hewson Consulants	15 48K	549
remediate English 1	F	Ruse Cassettes	16K	E4 50	Maze Death Race	Č	Pelsona Software		4 - 4
remediate English 2	F	Rose Cassettes	48K	£4 50	7.020 0.04.1.1000	,	Services	48K	149
ne mediate Maths 1	F	Rose (assettes	4BK	£4 50	Maziacs	G	dK from s	16 48K	£49
ne mediate Maths 2	Ė	Hose Cassettes	48K	£4 50	Mazing	G	Spec a Soft	15K	64 9
rvaders	Ċ	dK tranics	16 48K	£4 95	Mazeman	Ę	Abe soft	16K	64.9
nvaders	G	Artic	16 48K	£4 95	M Coder II		Pe sona Software	, , ,	E 7 .3
	Ġ	Abben Electronics	16K	£5 95	M. #006, 11	L	Sources	48K	199
rvasion rvasion Force	C	Appex theoreonics	16.4BK	£4 95	Managada	G	Softek	16 48K	155
		iCL	16K	£6 95	Megapade Melbourne Draw	D	Meibourne House	48K	68.9
rven jons 1	E								670
nyilimbie island	G	Richard Shepherd	48K	£6 50	Metacalc	2	Wark Force	16 48K	
Q Test	D	Flowchart Ltd	16K	£5 00	Meteor Storm	5	Quicks va	16K	[4 9
ackpo.	C	Computer Remals	48K	£5 95	Mere olds	C	Softek	16 48K	64.9
tickpot Flait Machine			an efective		Meteroids	€	dK trancs	16 48K	649
Subma ine Attack	C	Richard Shepperd	48K	€4 95	Met ic	E	Charksoft	48K	£1 2
aws Revenge	6	Work Fo ce	48K	15 00	Microbridge	C	Siela Sofiware	4BK	£79
zwz	G	dK Ironics	16 48K	£4 95	Micro Chess	G	Art c	16 48K	16.9
Jutpac	C	Ashby Computers	16K	€5 50	Micropen	D	Contrast Software	16 48k	65.9
igsaw	Ġ	Artic	48K	£5 95	Micro ax	6	Mic otax	48K	£ 24 9
Ichany Reb	G	Mazathlatien	48K	£5 50	Material	G	Art c	16 49K	.49
IC-E-E	€.	Flowcha turd	16K	£5 00	Mimpede	G	Saftek	16 48k	€5.9
Journ	G	Sofiek	16 48K	65.95	Mined-ou	C	Quicksi va	4BK	£49
Jumping sack	G	magine	6 48K	65.95	Mines O! Mor a	G	Severn Software	4.8K	f 5 9
Jungle Fever	G	A&F Software	16 48K	£6 90	Mines Of Saturn Return				
Junio Education	E	Calpac	16 48K	£5 50	To Ear h	G	Mikra Gen	16K	175
Juniu School Turoi	E	Essex Software	16K	[4 95	Mission Impossible	G	Silversoft	16 48K	£5.9
Inight s Quest	Ğ	Phipps Associales	48K	65.95	Modelie X	В	Cases Compute		
(nockou	Ğ	M k o Gen	48K	£6 90	T-D DETIG		Simula ions	16 48K	180
Anat in 3D	G	New Ceneralie 1	48K	65 95	Mo ar Mau	G	magine Softwale	6 48K	15.5
CRAK T	G	Artic	6K	19.95	Mon tar	ъ	Pict iresque	16 4BK	£ 7 5
Frank Kong Panic stand	Ğ	Clach	6.4BK	65 00	Mon or and Disassembler		Crystal Computing	6 48	189
rigame	G	Quicksi va	16K	6395	Monsters in Heli	Ğ	Sp+tek	16 48k	65.99
ushd of Sagur	G	Mikro Gen	48K	6 90	Monte Calio	G	Micromaga	16K	64.9
	_		6 48K	£7.90		D	ZX SAS	6 48K	E 5 O1
language Developmen	Ę	Micro Master			Mortgage	D		16 48K	18 00
lasei Snaker	3	Pappy Soft	48k	65.95	Morrgage Loan	D	Hilderbay	10 4BK	18 0
aserwa p	G	Mikra Ger	48K	E 6 90	Multi Function Cash	-			
grat.ou	G	Conrast Software	48K	E4 95	Contole	D	Richa d Shepherd	48K	£10.00
lear To Play The Guitar		Laserspund	16 48K	66.95	Mult fant		Image	16 4BK	t4 9
æarning	E	A√C Softwale	6K	£300	Multi pie Account Budget				
æliers and Numbers	E	ർന്നുമനം ട	48K	£4 95	System	D	Doc modus	48K	£9 9
ught Cycle	G	Persona Software			Muncher	G	Silversoft	16 4 BK	15 9
		Services	6 48K	£4.95	Music 1	D	Cr	16K	669
umited Overs	G	Micromor	16K	£4 99	Music Maker	D	Balfflower Software	48K	£5 7
undrick.	G	Hornby Software	48K	+695	Naanas	G	Mikro Gen	16 48K	15 9
unear Programming	E	un versity Software	16 48K	£7.95	Namida Raiders	G	Art c	16K	#3 44
LISP	ш	Serious Software	16 4BK	£15 00	Night Fligh,	G	Hewson Consultants	16 48K	£5 9!
LD(rK	C	Virgin	48K	£ 7 35	Note invaders	E	Charksoft	48K	£9 25
LC51	G	A11 94L	48K	1795	Nowetrik Puzzle	G	Phipps Associates	18K	€4.9
what Clobs	G	Quarrec	6 48K	16 95	Numberton	E	Critten & George	4BK	£79
Junai Resolve		Compute Rentals	16 48K	f 5 95	Numerics	E	Spec+re	48K	£59
Wathine Code Test Tool	U	Oxfold Computer	16		Cicevel Chemistry	E	Carpac	48K	£55
	-	Publishing	48K	E9 95	Omnical	D	Microsphere	4BK	199
Mar od 1	L.	Airwayes	16 4BK	CB 00	One Hund ed and Eighty	Ġ	Mikro Gen	48K	€6.9
May to Construction &	Ü	Pinehursi Data Studios		£7 00	Orb	G	Impact Softwata	48K	£5 0
Animation	J	. 11-0-10-31 224(8-2100)03	7.27.4	27 00	O biler	G	Suversoft	15 48K	159
	G	Mikro Gen	48K	£6.95	Orpheus	G	Visions	16 48%	169
Mad Marcha		in the second	16 48K	15 95	Ostron	G	Softek	16 48K	£5.9
Mad Mazika	, G	Mikro Gan	10 401	10 95	Over The Spectrum Na	G/G	Malbourne House	16K	f5 9
1620				-			Malbourne House	16K	f5 9
			1		Over The Spectrum No. 2	Gu	Melbourne House	16K	159
INOTHER GAME	4	1	177		Over The Spectrum No. 3	G +	ABF Software	16K	£70
INOTHER GREAT	and a				Painter				£5 9
INOTHER GAME ANCADE GAME FOR THE 18/48K			1		Panic	C	Mikra Can	15K	
MOTHER GAME ARCHOE THANK FOR THE THANK SECTRUM			218	11	Paradroids	G	Mikro Gen	ABK	16.8
INDITIES GAME ARCHDE GAME FOR THE SEASK SPECTRUM		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Party	E	N Darwood	16K	£60
INDTHE GAME ARCHDE GAME FOR THE 16/46K		1	1	10.00		~			1
INDITIES GAME ARCHDE GAME FOR THE INVENT SPECTRUM		1		1/	Pasca 4		Hisoft	48K	
INDTHE GAME ANCADE THE INJUNE SPECTRUM]/	Pastimes 2	G	IC ₄	16K	£49
INDTHE GAME AICADE GAME FOR THE 1848K					Pastimes 2 Par the Postman	G	iCu Mikro Gen	16K 48K	£49 £69
INDTHE GAME AICADE THOSE FOR THE THOSE PECTRUM					Pastimes 2 Par the Postman Patience	G G	ICu Mikro Gen Haven Hardware	16K 48K 16K	£4 9 £6 9 £5 9
INDTHE GAME AICADE GAME FOR THE INDEK PECTRUM					Pastimes 2 Par the Postman Patience Pawnchess	G G G	IC. Mikro Gen Haven Hardware Contrast Software	16K 48K 16K 16 46K	£4 9 £6 9 £5 9 £4 9
INDTHE GAME ANCADE GAME FOR THE INDEK PECTICIAN					Pastimes 2 Par the Postman Patience	G G	ICu Mikro Gen Haven Hardware	16K 48K 16K 15 46K 48K	£4 9: £6 9: £5 9: £4 9: £5 9:
HOTHER GAME ANCADE GRANE FOR THE INVEST PECTICIAN		KRAZ			Pastimes 2 Par the Postman Patience Pawnchess	G G G G G B	IC. Mikro Gen Haven Hardware Contrast Soltware Supersoft Hilderbay	16K 48K 16K 16 46K	£4 9: £6 90 £5 9: £4 9: £5 9:
HOTHER GAME ANCADE GLASEK FOR THE ILLINGIK SECTIFICATION	0	KRAZ	Y		Pastimes 2 Par the Postman Patience Pawnchess Pawnchess	G G G	IC. Mikro Gen Haven Hardware Contrast Software Supersoft	16K 48K 16K 16 46K 48K 48K	£4 9: £6 90 £5 9: £4 9: £5 9:
HOTHER GAME ANCADE GLASE FOR THE ILLIES SECTION		KRAZ	Y		Pastimes 2 Par the Postman Patience Pawnchess Pawnchess Pawnchess Payroli	G G G G G B	IC. Mikro Gen Haven Hardware Contrast Soltware Supersoft Hilderbay	16K 48K 16K 16 46K 48K 48K	£4 9: £6 9: £4 9: £5 9: £6 9:
HOTHER GAME ANCADE GLASE FOR THE ILLINGIK SECTION		KRAZ	Y		Pastimes 2 Par the Postman Pavance Pawnchess Pawnchess Payroli Panatrator	G G G G G B	IC. Mikro Gen Haven Hardware Contrast Soltware Supersoft Hilderbay	16K 48K 16K 16 46K 48K 48K	£4 9: £5 9: £4 9: £5 9: £6 9: £8 9:

					RE CHEC	13/1/11	The same of the same of		
Phantasia	G		48K	€5	99	-	(E)	all the state	
Phantesmagraphics	D	Saugn	16.46			100		-	
Pharoah s Tomb	G	Software For A	48K	£6		-112	10	The Park Name of Street, or other Pa	
Pharoah s Tomb	G	Phipps Associates	48K	£4		1			7
Phones	D	Wimsoft	16.48			人方便是		: - c	1
Physics	E	Think Tank	48K	£6		11/18		100	
Physics O Level	E	Homestudy Ltd	16 48						
Physprob	E	AVC Software	166	£3:		V 43	2		: I i
Pirot	G	Hewson	18K				ć√ a		1 9 1
Pimania	G	Automata	48K	65		4	2		
Pinball	G	Winters		f101		, Joe	-5	76 A TO 1	9 B
Pirace	E	Chalksoft	16/48			-55			
Pitfuli	Ĝ	T Starton	48K	£9:			1,015,000	The second second	
Pitman 7	Ğ		48ĸ	€ 6 5			Spirit House		
Planet Of Dasih	G	visions	16.48	,			-		
Planatoids		A. tic	18 48		15	- 100	The second limited	and the second section is	
Plunder	G	Psion	16.48	K E5.9	5	100	House		
-, under	G	Cases Computer				The same of	SUPTO		
Polynomials	_	Simulations	48k	660	O Ship Of The Line				_
Pontoon	E	University Software	16.48			G	Richard Shephe a	16 48	
	G	Contrast Software	48K	€4.5		G	Impulse Marketing	6 48	K,
Poo	G	Bug Byte	15/48)	£59		E	Sherston Software	48K	
Pools Prediction	D	Selec Software	16K	175		G	Silve soft	16 48	K ,
Pot Pourr	G	JRS Software	16K	£48			Psio v	49K	t
Power House	G	Sector Software	16K		-00.4 - 00.5	G	Quicksilva	481	- 1
Primary Arithmetic	E	Ross Cassettes	4BK	£49		G	Amba Software	16K	,
Print Shop	G	Cases Computer	4DK	E4 5		G	A ric	6 4HA	
		Simulations	4.0.14		Shake Pir	G	Postern	16 48k	
Privateer	G	MC Lothic ian	16K	£5.0	- TI DONE.	Ğ	v-sions	16 48k	
Process Timer	D		48K	€5 5		Ğ	Artic	_	
Programmer s Dream	U	Photosoft	48K	£79		Ü	Saltek	16 48K	-
Programmer s Toolkit		Work Farce	16 48K		5 Softtime	Ď	Softak	16 48K	-
Programs From Spectrum	ч	JRS Software	18-48K	£5 9		G	Softer	16 48A	
Machine Language Book		44			Soi taire	C		48K	
Program 4	G/U		1 6K	[5 9		_	Haven Ha dware	16K	
	G	5D Software	16K	£6 50		ç	video Software	1 (6 K	E.
Pro Go I	G	Hornby Software	16 48K	£4 9!	4 4 - 0 00345	G	Mikra Gen	48k	L
Project dast	₿	Sigma	18K	£6 00	-44. 11.11	~	dK tronics	16 48A	
Project cost 2	B	Sigma	48K	£8 00		C	Wir ers	6 4BA	
PSSST	G	Ultimate	16,48K	£5 50		G	Quicksilya	16K	
Punc man	E	Chalksgfr	16K			G	Psic -	16 48k	
Purchase Day Book	В	Transform	16 48K	£5 95		G	Winte s	16 48K	-
Purchasa Ledger	D	ZX SAS		EB 75	- 41 5 151			- LI 4-DI	E .
Quackers	G	Rabbit Software	15 48K	£10.00	-F4-0-1 B124	G	Mikro Cen	16k	
Quarte ly Analysis	B		16 48K	£5 99		E	Chalksof		L i
Quazer	c c	Transform	16.48K	£4 75	Spawn of Evi	G	aK tronice	48K	L .
Duetzalcoar		Rose Casselles	16,48K	€4 95	SPDE	D	Cambell Systems	†6K	
Duesi	G	Virgin	48K	£795	Speakeasy			16K	E =
Pace Fun Rabbit	G	Hewson Consultants	48K	£5 95	Spec Bug	7	Quicksiiva	48K	L 4
	G	Rabbit Software	48K	f 5 99	Spectadraw 2	E .	A tic	6 48K	16
lacing Manager	G	Virgin	48K	£7.95		D	BS McAley	48K	1 2
apedes	G	Visions	16,48K	15 95	Spectipede	G	Artic	16 48K	- 4
ledweed	G	MC Lothlorien	48K	€5 50	Specifical	G	R&R Soft ware	1.6K	. 4
leg/ession	Ę	University Software	16 4BK	17 95	Spectral Invaders	G	Bug Byte	7.6 k	. 5
diections	G	Art c	1 B. 4 BK		Spect alpanic	C	Hewson Consultants	6 K	(5
anumber Delete	_	Work Force	16 48K	£5.95	Spect ec	G	Palant	48K	5
epulsar .	G	Solvek		£4 95	Spectres	G	Bug Byre	75 48K	
epulsa	Ğ	Haven Hardwa e	16 48K	15 95	Spectron	G	Virgin	48K	Ld
8sc.ue	Ğ		16K	£4 85	Spectrum Chess	G	Oxford Compule		E 7
etail Accounting	D	Computer Rentals	48K	£5 95		-	Publishing	16 48k	:8
eversi	_	ZX SAS	16.48K	£10 00	Speci um Compiler	U			
PVB(S)	G	Sinciair Research		£7.95	Spectrum Demo Tape	В	Wye valley Software		L
oad Ascers	G	Artic	16 48K	£5 95	Spectrum Games	G	Hilderbay	6 48k	٦,
oad Foad	G	Art c	16 48K	£4 95	Spectrum Golf		JRS Softwale	ВK	F #
	G	dK tropics	16 48K	£4 95	Spectrum Special 1	G	BS Mc Alley	16 48K	13
bbe	G	Virgin	48K	17 95	Speci um Zapi	Ģ	Shiva Software	16K	F-,
bor	G	Sofrak	18 48K	£5 95	ZX Reactor				
bot Par ic	C	Soft Mill	16 48K	19 95		G	ASP Softwale	16K	. 8
man Empire	G	M.C. Lothiosan	16.48K	£ 5 50	Specisourd	Ð	PDQ Software	16K	E.
×	D	Llamasoft	16K		Spec veders	G	Hewson Cor sultants	16K	+ 4
ule++e	G	Micromega		£295	Spiat	C	Incentive Software	48K	. 5
yai Birkdale	G	Homby Software	16K	£495	Speckymen	G	Abbex Electronics	16K	
n Rabbit Rup	Ğ	Video Productions	48K	E6 95	Stertighter	G	impact Scitware		[4!
Andrews	G		16 48K	£4 95	Starfire	Ğ	Vigin	6k	£ 5 '
es Purchesu Ledgers	В	Artic	48K	£5.95	Starship Enterprise	G	Silve soft	48k	7 9
les and Purchase Ledgers	B	SD Micro Systems		[10 00	Starter Pack 7	F	Coll os	48K	655
de Day Book		Hester est	48K	£ 25 00	Starter Pack 2	E		6 4BK	.99
es regide.	В	Transform	16 48K	[8 75	Stal Trek	_	Coturs	16 48K	199
rura: Warriors	D	ZX SAS	18 48K	£10 00	Startrek	G	Mikra Gen	16 48K	650
nurai Warriois S Assault	G	M C Lothiolian	15 48K	£5 50	Star Trek	G	Gemin Software	48K	159
	G	Mikro Gen	16.48K	15 95	Star frek	G	Fuller Micro	6 K	€5.5
F	G	VISIONS		£†9 95		C	impact Software	6K	65
zoids	G	Imagine Software	16 48K	£5 50	Star Trek	G	R&R Softwa e	48K	169
amble	G	Work Force	16 48K		Star Werrior	G	V-\$IODS	5 48k	669
Bniple	G	Mikra Gen		£4 95	Statistics	O	Severo Software	15 48K	
be word processor	D	Sigma	16 4BK	E5 50	Statutory Sick Pay	В	Hilde bay		£6 4
	E	Chalkson	16 48K	£8 00	Stock Control	D	Kempuid		1350
	G	Problem Observe	48K	£8 95	Stack Centra	Ď	Gemini		E 4 5
0 .		Richard Shepherd	48K	£6 50	Stock Control	D			L 79
	E	Widger Software	15 48K	£5 25	Stock Controller	9	Milderbay	48K	6.7
	8	ZX SAS	16 48K	E 6 50	Storm-Fighters	_	SD Micro Systems		£ 500
Ph.	G	Virgin	48K	£7 95	Sub Track	G	John Prince	6 4BK	F4 95
or canic	G	Visions	16 48K	£5 96	Superchess Two	G	Amba Software	16K	[4 99
	し	Work Force	48K	£7 50		G	CP Software	48K	1 95
ly	_	10010 7 0100							
ly .	Ğ	Artic		C6 95	Supercode Superdeflex	Ď	Supersoft	16 48k	£9 95

Der 16	B. J	Supersof:	48K	68 95	Young Learner 1	E	Rose	16 48K	65
per Glooper Frogs	G	Sinclair Research	16K	£4 95	Young Learner 2	E	Rose Software	16 48K	£ 5
perpack I	D	video Software	48K	£7 00		D D	Clystal Computing Stellar Services	48K 48K	£10
perpian	D	Video Software	48K 16K	£ 2 00 £5 00	Zod ac Zod ac	D	Stellar Services	48K	83
perplay po Soccer	Ğ	video Software Winters	16 48K	£7 00	Z.od ac F	Ď	Stella Services	48K	E 15
be Soliwa e Pack	G	Spartan Software	15K	[8 95	ZX Adventure	G	Syrtis Software	48K	£ 5
or Spy	Ğ	Richard Shepherd	48K	£6 50		t.	dK tranics	15 48K	€6
youd Figh	Ğ	Solarsoft	16 48K	65 95	ZX Forth	w	Art c	48K	£ 25
\$ 64	J	Art c	16 48K	66.95	ZX Games 1	C	ASP Software	16K	£
bies	Ŀ	AVC Software	16K	£3.00	ZX Sideprint	₩.	Microsphere	16K	£
biesums	E	Griffen & George	48K	67.99	ZX Simulsq ve	D	A Turnbul	16 48K	1
ibeu	9	Jaysoft	16 48K	64.95	ZX Trek	G	Impact Software ASP Software	48K 48K	£
r k Barrie	G	Winters Con rast Software	16 48K	£4 50 £5 95	ZX JURY 1	h _e d	ASP SOTWARE	40%	3
ne Header Reade	D	Tagnar	48K	67.95					
Sword Tw.	D	Tasmar Software	ABK	€ 3 90	5D Soll-warn		AVC Set	rware	
ache Dara	E	Bran Farrs	48K	£5.20	Hompland Avenue		PO Box 4	415	
il he time	Ŀ	Pappy Programs	16K	£5.50	The Capar N Looking		Marboros Biling ng ng		
77.5	G	W miers	16 46K	(5.50	Diss		817911		
may Dale	G	Melbolime House	48K	66.95	Norfolk		Ams		
ny March	G	Computer Rentals	48K	£5 95	Abacus Electronics		7 8400	Meld Avenue	
e Arcadian	G	JK G aye	16 48K	[4 95	186 St Hater is Avenue Swansoo		Loughtin Leicester		
e aste	G	Buy Byte Quicksiiva	16 49K 48K	65 95 66 95	Mezi Ciawiniday		LE 1 7.		
e (Ness Player e Darabase	G B	M CROL	48K	1995	Abbe - Electronics.		Patrice	BI Software	
re Danabase re Jungeon Master	G	C ystar Computing	48K	[6 95	20 Ashley Cour		6 Rusew	rood Avenue	
u Fores	G	Philips Associates	48K	19 95	Careat No thiosis		Creen to		
e Golden Apple	G	Art c	48K	16 95	Londor NW4		Middlese		
e Hobb	Ğ	Me bou he House	48K	£14 95	Abersoft		P Bharra		
pe-di-na	D	Sinus Logic	48K	£ 5 9 5	7 Maps Atulen Bow Skiet		3 Wensil Harpend	ey Close an	
e nvisible Ma	E	Cha ksoft	6K	85.95	Dy'rad		Heris AL		
if Nig 1 Sky	D	B idge	6.4BK	EB 90	5Y24 5BA		Brane Su	hware	
e Ç. rt	G	Compule Rentals	48K	[4 95	ALS Sol ware		Myrtle C		
ie +'v amid	G	Pulitasy mparit Softwale	48K 48k	£6.95 £5.00	7 Lidgett Crescent Roundhey		Brane Sacased		
c 3 aust c 3 aust	В	M CROL	48K	£9.95	Leeds		Penzanu	e 1920 89E	
e imb of Dracula	G	Fe x Spftware	48K	E4 95	Addictive Games		Bridgem	an ter	
e an Came	6	Microsphere	6 4BK	£5 95	PQ Box 278		5 Keyne		
e sincane	ő	ASP Saltwa e	48K	£11 45	Connibutión Milton Kovnes		PO Box Slaugh S		
e W Lard & Warr Drs	Ğ	Abersoft	48K	14 95	MI 4 7NE		_		
e Wrid Processo	D	M CRO.	48K	£9.95	Abr Sn ware		Bridge S 36 Ferny		
is Zman Advontate	G	Softek	6K	E 4 95	10 Wilpshire Avenue		Marple B	liidge	
in the wall scramble	G	Sinc ai Research	16%	14 95	Manches el		C-heshire	SKE SHE	
T.F.	Ę	Ster Software	6%	£5.95				por ing Sgrvices	
megate		Quicksi va Mikro Gen	48K 48K	[6 9 5	As waves Computers and chould		45 Sand No week	r igham Road	
thinguest Sor	G	E fin Softwale	488	£7.95	Pins in ie				
Str. K.		Star Dreams	484	E9 95	eighton Buzzard Bedfurdshire up 7 9AN		Biyar Si The Ho	Surware	
00 IUR		Sinc a Research	6K	15 95			Chalcot	Lane	
di u		Texga e Computers	16 48K	£6 95	Amiua Suhware Freepost		Nanh Be Bugran F		
300	G	Quicksiya	48K	19.95	Cambridge		W25 51	550*	
arz Am	C	2.331 is	6 48K	£5 50	CB3 7BR		PDZ 51	18	
arsylvan an Tulwen	Çı	Richard Shepherd	48K	[6 50	Amerisham Software				
25	G	Soft upe s Software	48K 48K	£5 50 £6 95	Long Roof			in 6 Shop	_
axx reasure Hum	G G	Quickshya Amba Software	16K	[4 95	Hervines Road American		3 Q 511	sa ham kigh Ana SW 6	d
Jūjā. 1692 P. B. HITL	3	Amba Sorrware ₩ za d	48K	15 50	Bucks				
pp.ea pp.ea	G	Work Fuice	48K	15 50	HP6 5H5		8 100 Byte	The Arbany	
1001	G	Hornay Software	48K	£6 95	A juliu American Sol- ware		Qld Hall	Stree	
ite i libe	Ğ	ASP Softwale	6 48K	15 95	138a St. apport Court Sparkfull		i verbuo	I	
ube and Tel or	Çı	JRS Software	48K	£5.95				-	
ur le	Ē	AVC Softwale	16K	£3 00	Anik		8ut and 44 46 E	s Co ar s Cool Road	
viatio Alhens	G	M.C. Lorbic ran	6 48K	£5 50	30 Kingse of Court		Fougot, A		
USA UDSE	,	ACS Software	6 48K	[750	Bellings Northampion				
se and Learn	E	MICROL	16 48K 6K	E 9 9 5			. Tech	F	
ser Defined for aphics altara	J G	Cornsill Movisoft	48K	£9.95	Arcadia Sot wale Freepost		184 Mai	rker Straer	
alnava elnot siciat	6	Quicksiva	48K	16.95	Swansea		Cheshire	:	
rices of the K	ă	(Tech	16 48K	66 00	SA3 477				
cent Universe	G	Quest	16 48K	£5.50	Artic jorripuling			amputer Sor wa	
blianic Dungeon	G	Carnell Software	48K	15 00	Mai 1 St. eet. Bran desburton		108 Heil Sr Johns	mi age Woods (i	P54
RW - D	D	Singlair Research	48K	£9 95	D* 1/6/0 4052 880		Woking		
n Ellä	D	Psion	16 4BK	19 95	Ashby Computers and G aphics L	Н	Sur ev	CIF	
lawpoint .	L.	ACS Soft ware	16 48K	16 50	The Green	2			
oce Chess	C	Artic	16 48K	£9 95 £8 95	Asby de a Zouch		Cambell Rous Ro	Systems ad	
la Cai	D G	Psion Oscar Systems	16 48K	14 95	FeiCele, ai spire		Buckhus		
Vs a the Vva 166 Velora	G	MC Lothier en	48K	£5 50	ASP Sof wore		E336A IG9 68L		
Mariarc Mari worth	G	Ho Nov Software	4BK	E10 Q0	45 Chaing Closs Road.				
Mnge i Avenge	č	Work Force	16K	¢4 50	Landon WC 2M OEE			де Мистосотрич	pi L
Wordprocess	В	Specire Soft	16K	£4.95	Astro Soft Ware		153 4 E Cambrid	as Road ge	
hard Processor	D	Quicksitva	48K	£5 95	28 Spinney Rise			-	
Nodscell	E	Griffen & George	48K	£7 99	Totor Bees on			ib Twate on Road	
World Info	E	Wimsof:	48K	£5 Q0	Mous ACB 61M		Stough		
Xisdom		Quicksilva	48K	16 95			512 TM1		
D=	u	Zen Software	16 48K	£4 95	Auton ara sid		C C		ппв
A Play Yehre	G	Work Force	48K	€5 50	65a Osborné Road		V-0586 V-1	omptiter Simula.	

£5 95 £7 95 £4 95 £6 95 £4 95 £4 95 £5 90 £5 90 £7 95 £8 95

£7 99 £3 95 £4 95 £3 95 £5 95

(25) (000) (495) (495) (495) (495) (495) (495)

SOFTWARE CHECKLIST

Chalksof 37 Willowsen Road Worcester WR3 70P

Children's Educational Software 94 Airedale Avenue Chiswick onder W4 2NW

Collins Edució ional B.G. afron Street London W

Computation 3 Thulis Close Greenwich SETO ANA

Computerwine Bicabolnam Way Erwalt Derby

Computer Remais and 45 Whitenhapet Road Condon E

Contrasi Software Fai than Road West uss Hanta GU33 6JU

Corollel Services 2 Penns - Way Aylesbury Bucks HP2 7 Z

LP So rwate
7 Oschard Linns
Prestwood
Bucks MP IR ONN

Clystal Compiding 50 Charles Close Wrotham Norwich NR 2 87 u

Custom Software 44 Aireview Tetrace Skipton North Linkstine

Cosporadata. 20 Flars Quay Cologare Nurvich NR3 (ES)

Carabase Sysiems 82 Thwels Read Payotol Cheshiro SK (2) 106

N Carwood Hahadro Shoud Petersheld Hamps in B

Digital integration 22 Ash charch Road Ash Aide shr Harts GC 2 64 N

Out Software 9 Twend Tose 5 Wir dur Wir SNL 3PL

ok intes 27 Sussex Road Gorres of Great Yarmou h No link

Obcimiodus 6 Walmerstey Ri ad Bury cancashire 8), 9, 500

East mend computer Systems
East read Mouse
Lyon Way
Comberrey
Surey
Sures
SEZ

39a Sinara Street unnder SW X 9A1

Eh Software Hudson House Barrery Road Great Yardiou NR 30 3NN

Emprise Software 41 Carlington Road Rother für 5 Yorks 550 362

Essential Softwork 47 Brunswick Centre London WC T Essex Software 16 Huntsman Dilve Upminare Essox

Fantasy Softwore Fauconhing Lodge 27A St. Georges Road Chetronham Glos GuSC 3DT

Fawkes Computing 41 Wolfridge Rida A vestor Thombury Bristor BS12 2RA

Felix Surrware 19 Leighton Avenue Pinner HAS 38W

Brian Ferris Bilhompson Acad Bolign BL 1 60F

Altan Firminger 7 Heme Hill condon SE24

Flowchairs, d 62 High Sireer Thingburough Northants NN9 STN

Forkade tid G6 timedean Yare Bristor 65 7 4 pg

Filler Micro Systems

the ZX Cerille

Sweding Street

Gen Software Int D The Maltings Sawor dgeworth

Camini Function at Sult water Specialists 9 Salterium Road Exmostr

Beninii Suhwata 36 Badmin or finad Leicestei LE4 780

Paul Giller 38 Gromwell Way Kidhigfut Oxfold

Grisof: 3s. Hawther - Road Barry 5o - h Grammigan CF6 Oct

Gittole Ed PO Box 50 Rugby Warks Cv 2 40

Nick Godwin 4 Hyrk o'c escer Eyemou h Belwickshire

r is Gouldstone 45 Bir eigh Avenue Wallingfür Sur ey SM6 TuCr

JK Greye Sor ward 16 Park Street Bath BA ZTE

Griffen Er George 285 Ealing Fload Alper in Wembiey Middløsky HAU H

Hard & Sol-85 Snowder Avenue Millingdon Middleses UB10 OSE

Hardy Software & Valindre Place Cardy ! CF4 ZAN

Hamland Software 8 Ponzance Place Londor W. 1 4PA

Haven Hardware 4 Asby Rhad Asby Workington Cumbria CA14 488 5 Hosser Software 15 Lythan Court Cardwell Clescent Suranighal Berkshire

Hestacies Lid PO Box 19 Leightur Buzzaid Beds LUT ODC

Hewson Consultants 7 g ahan Cluse Blawbury

Hildginay End B. O Parkway Regen's Park Lander NW 7AA

Hitton fumpuler Services 1.4 Availon Road Orpington Kem 886 94.3

Misof: 60 Hallan: Modi c don Swindoi Wil: shire

Holly Prinducts Blackthorn House Dukes Lune Gerlalds Closs Rycks St. 9,7 (2)

Homes: dy u d Treleigh Woods fai Redvu h Tornwall

Hainby Surware 2 Parfold Hill Leads S 5 0PW

i() Purvey Brdge Lurdon

IE Applications and 1.77 Captietur Ruad Mullingham Lindor SE9 408

Image Soft will B 85 Ein Road New Maiden Surrey & T T THA

imagine Solfware Masons Building Fachange Stille East Liverpoor Mereeyside 2. 3PN

Impact Sot ware 70 Regford Aver up Edmburgh EM13 OBW

in pulse Marketing Spirices 3 - 32 The Collonade Prece Hall Halifox Weg Yulkshire

incentive Software 54 London Street Reading Bucks RG 45G

Jaysti I 72 Dane Aures Brshop's Stor ford Marts

unijams Still ware. The Radieth Plealey Pooreshury Shrewsbully SYS OXF

JRS So ware 9 Wayside Avenue Warthing Sussex 6N13 July

Kempild 43 Muswal Hill London N O 3PN

Kuma Computers and 1 York Road Maidenhead Borks

26 Avondale Avenue Stones Middlesex sevel 9 Computing, 229 Hughenden Road High Wychn be Bucks

Liamasu Suftwale 49 Mount Pleasant Tadley Harits RG26 68N

Cogic Systems 129 High Stree Cherry Him in Can bridge

tongman Software Longh ar Oroup of Longman House Burnt Milh Harlow Coses Maillus

Macronics 26 Spiers 1 asii Kinowie Solmoil West Missarios 863 985

Marrech Lames
9 Dillingburdogh Ruad
East dour e
Fast bour re
Eurit Subabas
BN20 857

David Mail in Associatios T1A Princes Road Richard Surrey TW - 0.60%

Mothik Son walle 3B Yardley Wood Road Mosely Britingham 813 938

8S M. Anny 1 Coydeaze Chinha Janno Xa 41c

MC comfor at 4 Cranby Phos cheadle Home Cheadle Cheatine SNB 6-5

MDA Pore Dve Comptor House Fambam Gu9 88W

Medidala Pulifica 26 London NV9 98W

Methoring Mn. sn Publishers 31 - afelger Road Gleer wich under SE C

Moow Michael Bi New Thank Close Branchoel Essex CM7-7PR

Marcol Freeposi 38 Burleich Street Cambridge CB 88

Millio Cumpurer Schrwall Janir D6 Pear Industrial Eslate Stockpoli Road Joven Bredbury Stockpoli SK6 2BP

Mikito Can LA Agai Clescern Brankhel Beiks

Micro Mastel 94 Ar dale Avenue Chiswick condon W4 2NN

Mill o Powe: B Ba Regen Street C hapel Ailer or Leeds LS 7 4PE

Micromego Parsona Comporal prvision Quante: Systems and Software Ltd 230-236 Laydode: Mill London SW-3-1LE Mic omo: 1 Elipabet - Clase Y - ystorgan Swanisea SAG GRW

Michisphere Computer Sarvice 72 Roseberry Road Condon N. O.2LA

Micro at 11d Bar a r House 4th Figor Chertsey Road Woking Sur ey G. 2 SAR

Di-Mousty Standfull Coringes Gianby Lune Birighati Noris Noris

MPT 42 Raedward Dilyn Buly St. Edmunds Suffolk

MP Sor water 3 Pion Miew Close Hasiemere Surrey Laz Eu

MS 13 The Bloodway Grandhes et Cambridge CB3 9NO

Milisarry Sn. Walle 46 Brener han Road Wat hamsrow Lindu E 1 SBA

Myrindu Sorware PO Box / Tadwin Sun By y Tud 7

New Generation So ware fleepron Older differences Bisson 85 5 588

Newso Products 17 Whitebolor Broad Hemel Hempsread Hems

Odyssey Con at ling 28 Bingham Ruad Silerwood None Nob ZEP

im rega Electrolics 37 Chicheste, Sipare clar reference Cour by Apolim BT 38 Cau

Orwin ShiP wate 26 Brown tow Rhad Willesder London NW | O

nami Systems
3 Length in to Tealand
traprow
Middleses

6

t Jowe Norington Lewes Road East Orins had Wilbusses HH HIJTA

Owind Fompurer Paulishers PC Box 39 Oxioid

PDO Software Paistey Rye Hidels Lane Edenbridge Kent TNR 6U

Palamii Programs Block air Hyde Jane Danbury Essex

A Parsons 23 Cowhili Gardens River Dover Keni

Personal Software Services 452 Stoney Stantor Road Lovent v

SOFTWARE CHECKLIST



Phipps Associates
99 East Finde
Epsom
Surley
KT17 EA

Photosoft 32-34 Alber: Si Frea: Manipshire Cir. - 3 aRL

Pic Bresolie 6 In Kalinew Hill West Will kham Fen 884 988

Prieturs Dara Strigton 69 Pinehurst Park West Moors Windome Jones BH22 OBP

Pragi Productions 19 Arpley Gardons condon W 4 BHF

Johr Ponce 2 à Brack Avenue evenshire Manchester M. 9

Puppy Programs
Riche and Norse
nigle 11
Careful (fr
Janes LAG BAN)

Poppy Sor ammor Hoad Headly Newsery Servs

PD Box 2
Andover Ford
Challenthar
Journal Stein Fold 55W

Process
309 High Road
Sughton
Esses

PSE 20 Shelton 5 reef Newark Non's

Psid Lifd k Munisworth Mews Gladueste Place Condrin NW 1 500

Purves
2 Stobbil Anald
Gore mage
Midlothain
EHZ 4PL

Guarret Systems & Software 230-236 cavender Hill Londu SW CE

Quest Mic. Soft walle 119 The Primeriode nettentian

QuickSilve Palmers: the Park House is Pamiers on Road Southampton 501.1 k

RBR Sphiware 34 Bourtor Read Glock ester 34 Que

RAM Write + vair da Hause 2 Gedar Gardens Silling Surrey SM2 508

Ped Shir Lod 2 Marier Read Stoke Newington Lundor N 6

DC Roue to 107a Royal Geome Road Burgess Hill Susses

Kine Classeries 48 Widney Land Spithul West Midlands 191 3L

Sar un Developments 37 Heor Duleis Birchgrove Swansea 5.4.7.3.1 Sawn computing 3 Stit at ternes Orive appointed Beverey Numberside

SO Micro Systems PO Box 24 Historien Binds SC4 OAE

Sacio Sofiware 4 Keats House Poichestei Mead Beckenham Kein

Selec Sumware 37 Colorally cane headle unestyre

Selious Suriware 7 Windside Road Balliev Bromley Kent 881 785

Sovern Sor ware 5 School Tabscer Lydney Glos CL15 5TA

Shadow Software Custom House 7A Rawmarsh Hill Parkgate Richerham S Inkahire 562 60 P

Richard Stepherd Scriware Freeposi Maderifiead Barks Sc6 584

Sherstur Suftware 1 Nobin Silver Shersto Malmesbury Willis SN 16 ONC

atriva St. Ware atriva Poblishing Ud y Charchicar e Nanswich estine

Signor Mill Systems to Naples Drive Newcastle Under come Shift now re Sits 20

Silversoft uig Lander Hause 27 - 273 King Street Landon Will

Silved - Valley Not 1: PO Box 2442 Hamilion d Indiana 45323 USA

Similar Resear 5 Slammope Boad Carchott y Surley Of 15 TPS

Sir is com 4.1 Byer v Rudo Figures Pur striou - Pt - SAX

Shif ek 329 Crusred Road London SE24

Soft Bi 5 Dai wood Din Glenrothes File KY6 au8

Snt. John Sortware Business Cent e Jacophion Rhad Birkennead Meisevarde L41 685

Soft Mill 20 Staniu - Ruad Hadderham Ely Cambs CB6 3AD

Sult ach. 31 campus Heris

Surtiwalle Culifage 9 Wearfield Drive Loughborough Laiceater LE11 3Qu Sor ware For All 70 Nor h Sheet Rumfold Essets

Software Masters 30 s. reolr fload Of or Birmingham

Solarshi Surahir e Books 19 Whintomb Stree Londo - WC 2 7HF

Spspan Sub-Warbor Ligh Time Did Road Lianell Ovi ed Wales

Spail an Soft ware 9 Carswold Terlach Chipping Norton

Shed le 2 Mill Cinse Galley Basingsinks Hans

Spire e Sul Junieli Con ag Mattmans cane Gerrards Closs Sul 888

Stat Dreams 7 Bain Close Seaford Suppey BN 5 3EN

Sier Sor wars 36 Jimphels Avenue Whalley Lanus 1986 993

Siehai Services 8 Fili Trag Vale Leeus LS 1 78 Y

Siena Sud weie 44 Pampis did Road 2 hydon Surrey CR2 60A

T Ship Au 7 \$ Au waler Hulab Masepev Briminghar 3

Suns Soll Ware noing Whey & Sons Col Balfins Cone Chanaster Sunsex PC 9 UC

Superson 91 Manur Ruad Lindon E 7

Syr is Roft wate 2.3 Q taranck finals Budgewater Sometise TAR 7E

Tueman Harriey di Escer Leens

Texpoles in roles to 4 Brook time Corde Miller Object 9H2 (3H0)

The Survival & Fair Carpin Fairn Carpin Fairn Brinny Bay Tipre awen

Think Tank Educational Soft walls 35 Weilington Road Wimbledon Park Londo 1 SW 19 8EQ

Tilan Sulfwäre The Compilier Palace 46 Markel Päue Chipperion Wills

Top Graph Software OB Blunded Road coton Bards CO 37 SP

T answer Lid 41 Kears House Porchester Mead Beckenham Kent Arph Tomboli 65 vicarage Road Calg Green 5 ockpor 5K3 5Hc

Totoliai Schware PO Bris 43 22 29 Mill Street Newport Gwei NPT 3XZ

Il imate Play The Came The Green Ashby delia 2 rut Leicesteishini LER 5 //V

nderstanding Cid The Production Willage - 00 Cilcknewood Jane Conduct NW 7 205

University Somware 450 Strang Stree Candon SW IX 90 y

v BHI Compute Services 82% Kingsi in Bridd Stantes Middleses

video Piodris Iona O catamian Alian Redcal Clinveland 1910 JPF

viden Software Stone cane Kir vei Stoorbidge West Midlands

Virgir Gamins III 61 63 Pur oberic Road Lundon W 1

v sions Somward Filinity Frigure Mews Studiano finest andon W6 9uT

Vuries Sp., ware 25 C. awfuld Road Hasheld Her's Aud-UPG

Walson's Smilware Services live for ages cong Roars Wes section fishes 17 6EC

Wida 50 - ware 2 Nicholas Garder's in trip W5 5HY

Widget Soft ware 48 Duil are Road London N. 9DT

Wirmson Ziu Brinikside Anab Wirmborne Dinne BHZ 5 28v

Winters of 3 24 Swarning and Trise Caroley our laste Sport volky DNA BoA

Wiza d Sohwain PG Box Zu Eur le hone File KV FRW

Wilder Supersoft
Of Broom Park
Tending of
Middleses TW 988

Muddside 501 ork Woodside Durn dris Park Eas Grosroad Sussex RH 9 22

Work Fille 40 Wrister Aver le curan Beds UISMA

Wye vigliny Software Parton House Killersiev Praidroshire

Zen Software 6 Palik Skieer Scarborough Nijob Yorkshije YO IZ 4Au

ZX SAS 42 45 New Broad Street Landon ECZM - QY

ices ad

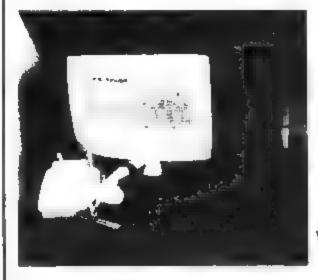
he s

ELVIC ES

ATTENTION!

- all ZX81 (16K) and Spectrum (48K) users - get this, the . . .

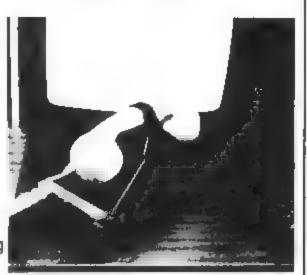
Micro-Myte



60

Only

£48.00
complete, inclusive of VAT, post and packaging in the UK only



It's the high speed computer phone link you have been waiting for

Transmits/receives at 1,000 Baud. Three times the speed of most other acoustic modems (including professionals).

Economic to use. Communicates data direct between compatible users Typically 120 000 bits per two minutes of telephone time. (Cheaper than a first class letter.) Also twelve times faster than a telex.

Simple to operate Connects directly to your cassette input/output sockets. Use your home computer like an online terminal. Link up with your friends by telephone or cable.

The Micro Myte 60 in its sturdy moulded plastic housing complements your home computer equipment

YOU CAN PRE-RECORD PROGRAM OR SCREEN CONTENTS ON TAPE. YOU CAN TRANSMIT OFF TAPE OVER THE PHONE AND YOU CAN RECEIVE ON TAPE

am a ZX81 Spectrum user (specify

Please send me Micro-Myte 60 modernis; at £48.00 each it end ose cheque, postallorder payable to Micro-Myte Communications Ltd.

Name

Te ephone

Address

Micro-Myte
Communications Etd
Polo House
27 Prince St
Bristo 1

Telephone (0272) 299373

Callers welcome

No fuss, no hidden extras, no rental costs

Each kit comprises an acoustic modern ZX81 and Spectrum software on cassette connection cable and operating instructions together with a twelve month guarantee.

STOP PRESS!

Micro-Myte 60 will operate with all makes of home computer software available soon

YOU CAN NOW TRANSMIT AND RECEIVE OFF TAPE!

UPGRADE YOUR ZX SPECTRUM NOW!

The "CHEETAH" 32K Rampack simply plugs into the user port at the rear of your computer and increases the memory instantly to 48K.

- Fully compatible with all accessories via rear edge connector.
- No need to open computer and invalidate guarantee.
- Why send your computer away and wait weeks for upgrade.
- Fully cased, tested and guaranteed.

Why wait any longer?

ONLY £39.95 inc. VAT and p&p



NOW MAKE YOUR SPECTRUM AND ZX81 TALK!

The CHEETAH "Sweet Talker" just plugs into the back of the computer using the existing power supply. Based on an allophone system you can easily program any word, sentence or phrase. Fully cased, tested, guaranteed and compatible with all accessories via rear edge connectors. Complete with demonstration cassette and full instructions. No more lonely nights!

Simply incredible at £34.95

Also available: 16K Rampack for ZX81 . . £19.75 64K Rampack for ZX81 . . . £44.75

Prices include VAT, Postage and Packing. Delivery normally 14 days. Export orders at no extra cost. Dealer enquiries welcome.

Send cheque/PO now to:-

CHEETAH MARKETING LIMITED

Dept ZX12, 24 Ray Street, London EC1 Tel: 01-278 6954

Please quote when ordering whether Spectrum or ZX owner 32K Rampack and Sweet Talker available from larger branches of John Menzies

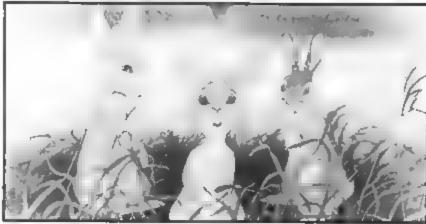




Computers for All dealers.

Run, rabbit, run

Could be rabbit stew on the menu today unless you get lucky in this program by Nick McQuaker of Stockport.



In this game, you control a rabbit running around inside a maze full of dots. The object of the game is to eat all the dots in the maze sooning a point for each dot your rabbit character manages to eat.

The maze also contains a jumping dog which tries to chase the rabbit around the maze Should the dog catch the rabbit character the game will end There are four different mazes which represent varying levels of difficulty. When you have completed one maze full of dots, you will be presented with a new one.

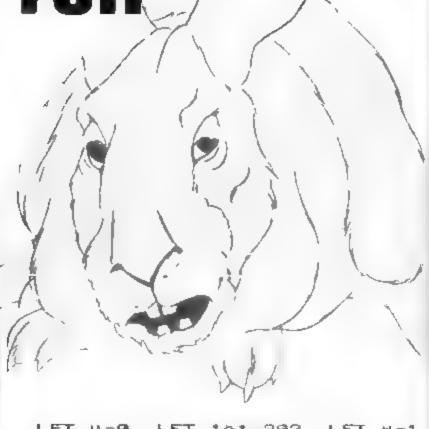
Line by line

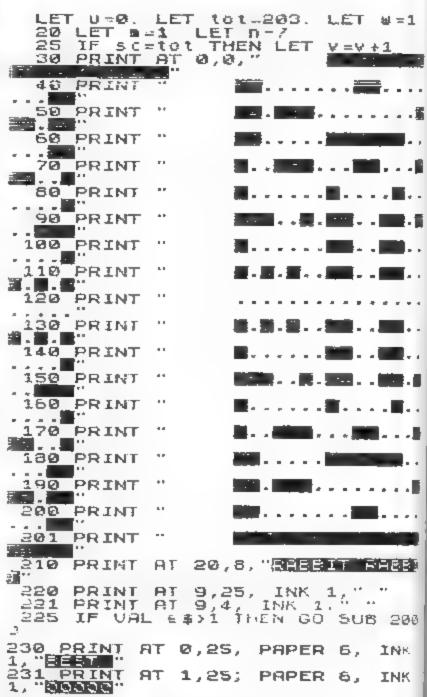
Here is a brief breakdown of the program in ghaighting the structure.

unes 1 25	In the se the game and call the subroutines for the instructions and for defining the user
Lines 30-238	defined graphics Draw the maze and call the subroutine for set
212.17	ting the difficulty
Lines 240-470	Move the rabbit and the dog
Lines 1000 1110	End the game
Lines 2000-2060	Set the eye of difficulty
	Contain the instructions
Lines 4000-4130	Define the user defined graphics
Lines 5000-5100	Are only necessary when the program is SAV
	Ed using the format 'SAVE_RABBIT_LINE

_								_						
	5	2	801	RDEI	R 2	2	PA	PE	R	1	I	NK	7	0
		3	LET	r v SUI	-0	<u>1</u> 5000	ET	ь	e -	0	L	ET	5.1	=2
		4	GO	SUI	8 4	100	- 66							
II	NS.	I F	≀UC	INT	NS:	ון פון ל	10,)/n	9;	"D	0	YO	U	HH	1T
	1	9	퉌	X:	§ =]	ENR	EY	*	I	F	× \$	= '''	" 7	HE
	1.0	0	IF	X s	_ ''' \) " > T N	TH	EN	G	0	SU	B (300	90
ŝΝ	JEI	_	DO	YOU	JF	8E6	IUI.	RE	ኃ (1-	4.)			
	1:	3	LET	INF	6 = 3	ENK	EY	- 1						. —
2 !	\$ <	4 > '	3"	e s ANI	() '	1 1	. A	ND.	e T	斯 (>" N	80 5	AN	ND 1
-3				1 6										_
	1	7	BOF	RDEF	3 2	2.	PA	PE	R	7.	I	NK	63	E

LET C=22: LET P=0





19

18 LET 1-2

L=16.

235 PRINT AT 0,0, PAPER 6, INK 1,"BEASE" INK 1, PRINT 1,0; PAPER "|00000" . RINT AT m,n; INK 4;"P" PAUSE 237 PRINT INK 4; "R", AT 238 PAUSE 100 241 IF W-0 THEN PRINT AT R 3, "0" 242 IF w=1 THEN PRINT AT m,n, 4, "R 13 PRINT AT 480 PRINT AT (,c, INK 1,"P" LET x=1 LET y=c LET g=m. LET h=n IF w 0 THEN LET w=1. CO TO 243 245 246 IF 247 249 IF W=1 THEN LET 248 ₩ = 12b IF L=# AND C -h THEN GO TO 249 200 ΊF INKEY \$= "S" THEN LET 250 C = C -1F INKEYS="6" 569 THEN LET L - L + 270 IF INKEY#="?" THEN LET INKEY = "3" 230 IF THEN LET C = C + 281 IF. INKEY \$="x" THEN CLS GO 10 1010 285 IF LOX OR COS THEN PRINT INK 1;" 290 LET 25-SCREENS 300 IF 25=" " AND F (1,0) 300 IF z = " " AND ATTR (1,4) \leftrightarrow 5 AND ATTR (1,4) \leftrightarrow 58 THEN LET L= LET c=9
301 IF c=4 THEN LET c-24
302 IF c-25 THEN LET c=5
303 IF t=m AND c=n THEN GD TO 388 T b([+1,0)-1 | Z\$="." THEN LET sc=sc+1 IF SEEP .002,0 331 LET P=U LET U-SC+(V*tot) 335 U-1000000 THEN LET q-1 U-1000000 THEN LET q-2 U-10000 THEN LET q-3 U-1000 THEN LET q=4 P(>U THEN PRINT AT 1,q;U SC=[0] THEN GO TO 11 342 IF 343 344 JF 345 IF IF 350 IF 388 IF U>be THEN LET be =0 381 IF be-10000 (0 THEN LET Z=)
be-1000 (0 THEN LET Z=2 THEN LET Z=1 382 383 IF be -100 (0 THEN LET z = 3IF 384 IF 2 =4 385 PRINT AT 1,25+z,be

IF the THEN LET m-m+1

IF the THEN LET m-m-1 386 499 LET W\$-SCREEN\$ IF W\$=" AND A ATTA (W,A) <>57 REENS (M,J) 415 LET IF (m,n) <>5 416 8 AND THEN LET 420 IF D-9 AND CAD THEN LET D-D 430 IF mg AND can THEN LET non + 1 435 LEJ 1=0 437 LET 5\$-". 438 b(g+1,h)=1 THEN LET b = 1IF 55=" " THEN LET i=1 439 IF 440 IF BOY OR DOS THEN PRINT 1947 - 1941 | 45-22254 | 45-23654 | 45-23654 450 LET 170 450 IF BAD BITH (M. D.) 175 AND ATTR (#, b) (357 THEN LET Ts r 465 178 GO TO 248 €,c, INK 4,"R" 1000 PRINT FO AT R p 12 FO 51 1001 BEEP .05,P 1002 NEXT P

7

- 鑑

- 55

t - 12

. .

. . 🔛

. .

. . 🎬

. . .

200

NK.

NK

1984

1005 CLS · PRINT AT 5,2, FLASH 1 . PAPER 1; INK 6,"BEBBIT STEW FE SECTIONS AGE IN" 1010 PRINT AT 11,0,"PRESS TO P LAY AGAIN, TO EXIT" 1015 PRINT AT 10,10; FLASH 1," S 1. SECTEBRA", U 1020 IF INKEY\$="4" THEN GO TO 1030 IF INKEY\$<>"n" THEN GO TO 11 THEN GO TO 1 320 1040 CL5 1100 PRINT AT 10,10, FLASH 1, P, PER 2, INK 7; "## BYE ##". GO TO PA 1100 2000 REM Change maze 2010 PRINT AT 5,12,".",AT 5,17," .",AT 13,12,".";AT 13,17;"."; LF T tot-207 2020 IF et="2" THEN RETURN 1 tot-207 2020 IF @\$="2" THEN RETURN 2030 PRINT AT 4,14,"..", AT 14,14 ,".." LET tot=211 2040 IF @\$="3" THEN RETURN 2050 PRINT AT 9,5," AT 9,24," AT 14,14 "LET tot-209 2060 IF @\$="4" THEN RETURN 3000 CLS 3000 CLS 3010 PRINT AT 0,10, "INSTRUCTIONS 3020 PRINT RT 2,0;" The object of the game is to dots in the maze, ng eaten by the dog eat all the without be: first.There are four levels o f difficul ty (1-4) . T AT 8,2,"THE RASSIT (40 TALRS BEEF urself)... 10,2, "THE DOG (up a 3040 PRINT AT 3050 PRINT AT 1 3050 PRINT AT 12,2; "CONTROLS"
3060 PRINT AT 14,5; "Left....5"
3070 PRINT AT 15,5; "R; 9ht...8"
3080 PRINT AT 16,5; "Up.....7"
3090 PRINT AT 17,5; "Down....6"
3095 PRINT AT 18,5; "Press x to e Alt at any time" 3100 PRINT AT 20,5,"TO START PRE SS ANY KEY" 3110 IF INK INKEY\$="" THEN GO TO 311 3 3120 RETURN 4000 FOR n-0 TO 7 4010 READ FOW POKE USR "P"+n, co 4020 NEXT FOR n=0 TO 7 1039 READ COW POKE USR "O"+h,cc 4040 4050 NEXT FOR n=0 10 1060 1070 READ FOW POKE USR "R"+n, re 1080 NEXT \$100 DATA 32,46,40,84,56,84,68,5 \$110 DRTA 6,7,24,62,178,64,160,1 50 4**120 DATA 0,0,70,1**35,248,120,72, 72,0 1130 5000 PRINT A: 1,9; INK 1, PAPER 3005 PRINT 5010 FOR n=1 TO 19 5020 PRINT TAB n, FLASH 1,"RABE. 5030 NEXT NEXT h PRINT AT 8,15; "PRESS ANY KE **3940** TO" 3050 PRINT AT 9,20,"BEGIN" 5060 IF INKEY\$="" THEN GO TO 506 5**060 IF** 5070 CLS 5100 RETURN



THE NEW FDS for the SPECTA ZX81, LAZER 200, JUPITER AC

This elegant desk top system designed for the professional user. In its slimline case, the same keyboard contains all the graphic characters above computers. With the additional function and SPACE BAR speedy and accurate data em made simple. The Fuller FDS is easy to instant on the very popular FD42 system it requires in soldering or technical knowledge. For the use is reluctant to install his computer circuit bow inside the FDS a buffer is available, at extrato which simply plugs onto the expansion port and connects directly to the keyboard The FDS is now Microdrive compatible

WOL

zap aro соп **JIO13** Also COL 5 60 DYS The a de

ach

ned 4..0

MC

Cert U

PRI

Th

,B.

PR

16

th

inst PR1

AH

80p P44

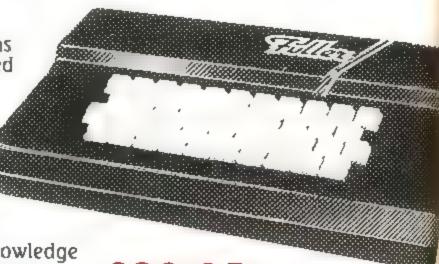
80p P&

The Natural Extension.

Firmly established in the development of computer hardware, the acknowledged leaders in their field, the vast range of Fuller experience is available to you through their comprehensive selection of accessories. This ever expanding range make Fuller the natural extension for your Computer.

THE FD42 KEYBOARD

For the 2X81 or Spectrum The FD42 has long been a best seller, the unit, housed in an attractive A B.S. plastic case, transforms the Sinclair computer into a useful professional unit, providing graphic characters for the ZX81 or Spectrum. The full travel keyswitches have gold plated contacts and are guaranteed for 106 operations. Installation is simplicity itself, and no soldering or technical knowledge is required



.inc VAT+ £2 50 p&P



RS 232 PRINTERFACE

Rom based software Versatile printer interface Comes complete with instructions and lead

CENTRONICS PRINTER FACE

As above but for parallel printer with CENTRONICS input £39.9 leads can be supplied at an extra cost!

DUAL PRINTERFACE Features both RS 232 and £49,0 CENTRONICS INTERFACE

Fuller Micro Systems The ZX Centre, 71 Dale Street Liverpool 2 Tel 051 236 6109 ACE, the superior ers for the ction key entry is tall base es no user who board a cost ort

ed

ge



54.95 (Inc. VAT) + 80p P&P

e Fuller Box —
e Sound System for the Spectrum £

FULLER BOX added to the ZX Spectrum. Improves the add quality enormously. The built in audio amplifier along well with all SPECTRUM programs.

FULLER BOX allows you to program your own music explosions, schimes whistles and an infinite range of other sounds. Based and the popular G1 AY 3 8912 sound chip. It gives you

and the popular G1 AY 3 8912 sound chip it gives younglete control over 3 channels of tone and or white the plus an overall envelope control

opposited with a joystick port, the unit gives instant imand over all your own games programs. The port impatible with all the commercially available

isticks egi Atari. Commodore

eft LER BOX is complete with full documentation and
temo tape which includes the type of sounds you can
dieve it also allows you to program your own sounds. Fifting
ash onto the back of the SPECTRUM, the FULLER BOX still
lives access for other peripherals. Including the new SPECTRUM
too Drives. via its duplicate user port.

tain Arctic and A&F games now with speech and sound effects

parades for the Fuller Box and Orator

systems can be expanded to MASTER UNIT specifications including the full range of controls. The upgrades must be fitted by us at the mickors

ITS INC VAT ORATOR to MASTER UNIT £14.95 FULLER BOX to MASTER UNIT £24.95

e Fuller Orator eech for the Spectrum

mash hit at a number of recent Micro Fairs the FULLER ORATOR har a lophone system. Based on the G1 SP0256 As voice thesiser chip. Directly accessable in BASIC it is able to say thing you command using the keyboard or a games program times in the standard case complete with its own audio piler it allows access to the SPECTRUM for other peripherals is duplicate user port. Full documentation and demotable tided.

11 nc v A T 1 £39.95 plus 80p p&p

K to 48K Memory Expansion Pack for Spectrum

the 16K SPECTRUM owner - upgrade your machine to 48K of twith the FULLER upgrade kit Complete with full assembly and ons - Model 2 or 3 only!

E,Inc v A T 1 £24.95 plus 80p p&p

£34.9 m Adaptor Boards for the ZX81

www.to fit your Ram Pack Inside the FD42 system. Accepts scommercial Ram Packs

£39.9 Int VAT £9.35 & 80p p&p

£49.9 80p P&

FOR FURTHER INFORMATION FOR JIK SAE
SEND ENTLOSED ABROAD MONEY
COUPDN

- 1

THE MASTER UNIT — The Ultimate Games Unit

The Master Unit provides all the requirements for the serious games enthusiast, containing not only the FULLER BOX, but also the FULLER ORATOR, all contained within the standard

The Speech Unit and sound synthesiser combines to provide exciting voice and sound for your games. The other features include Cassette interface a variable audio output which may be connected directly to a HI FI system. The MASTER UNIT provides endless scope in applications, and it allows ascess to the SPECTRUM for other periferal, via its duplicate user port i.e. printerface. The MASTER UNIT is complete with full documentation and demo tapes which includes the type

of speech and sound you can achieve

(Inc VAT)
+ 80p P&P

ons, ed

fiects

Fuller Quality

Fuller Micro Systems reach for the highest quality in Research and Development to make our products the BEST

Fuller Service

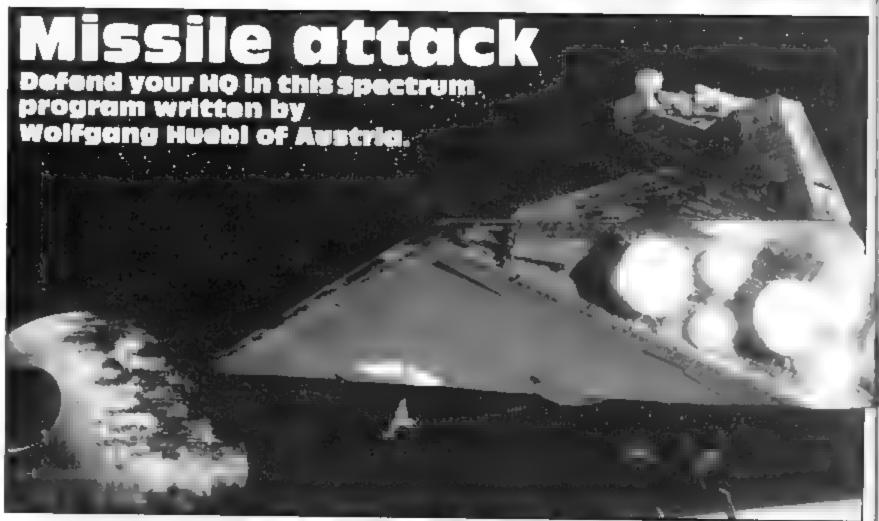
to an effort to provide the best service we have built a new MAIL ORDER dept at 71. Date Street, Liverpool 2. Due to come into service soon.

Fuller Guarantee

All our products carry a worldwide one year guarantee

FULLER stock a full range of components and kits for your computer send SAE for details

Please supp y the following items	state items and quantity!
piesase send me	£
please send me	· £
please send me	'et <u>T</u>
p ease add £	for p&p
enclose a cheque PO payable to FULLER MICRO SYSTEMS Total 5	or debit my Access
Barclaycard - Card No	
Signature	keep.
AT Name	
Address	VISA
DEALERS REQUIRED FOR UK & AS	ROAD 051-236 6109



Your aim in this game is to defend the Moonbase HQ against a miss e aftack from the alien ~vaders

When you first run the program, you are presented with two sheets of instructions expaning the operation of the game Then you will be invited. to press the o key to begin the game

Misile madness

When the game is first set up, you will see the commander of the noonbase within the HQ block perched at the precipice of a moon crater. At the bottom of the screen is a ray gun which fires diagonally across the screen it is your job to fire the ray gun at the missiles which cross the screen from eft to right to stop them reaching the HQ

There are two different types of missile black and yellow and these can only be destroyed with the right kind of death ray from your ray gun You must press the 'p key to fire a death ray to destroy the black missiles and the qikey to destroy the yellow missiles You get one shot at each missile so don't waste your shots

If you manage to hit one of

the mission there is one se cond BEEP and the word 'H TI' appears on the screen near to where the missile was destroyed You score one point for each black missle you shoot down and two points for each yellow miss leif two missiles are shot down simultaneously you score six points a though if you miss either of them you will score no no nts at a

Should you miss aim ssile it will continue on its path and cause destruction to the HQ f the alien invaders' aim was right in the first place. If the HQ is destroyed leaving a path. for a miss le to get through and bit the commander of the moonbase, the game will end-

There are three skill evels pertaining to the various acores you must reach before the alen invaders stop firing missies at your HQ. On level one you must achieve more than 30 points on leve two you must get 50 points, and on eve three you must destroy missiles worth 70 points before the enemy give

Line by line

Here follows a breakdown of the program for you to get a better idea of what is going on

structions and to choose the sk ! eve Lines 105 105 and 500 Contain the routine which selects the random numbers to decide what will unes 107 170 Contain a routine to make a miss e fly and also to allow you to take a shot at it. Lines 200 250 Contain a routine which destroys a portion of the HQ should a miss le ht Lines 300-350 Contain a routine to make a missie fly and also to react if it hits anything in its path Line 500-575 Contain a routine to make two missiles fly at once and also to allow you to shoot at them. Lines 700 830 Contain a routine to make two missiles fly at once and also to react f they hit anything in their path Line 900 Contains a routine which reacts when a missile hits the commander of the moonbase

xand

Contamaroutine to print brief in-

Variables

Lines 30-80

Here to ows a 1st of the main variables used throughout the propram

d	Data used for the use
	defined graphics
1	Skillevel (1.2 or 3)
Z	Score 0 to 75)
h	Height at which the
	HQ is put (varies ac-
	cording to skill lever
9	Determines how many
	shots the player has
	got (0.1 or 2)
yand	Determines the line on

Determines the ine on le2

which the miss leif ies

at which the missile is or shal be printed or erased Determines the colouof the missile ATTRibute of missies last position. а ATTRibute of missile's new position eO Determines whether the black miss e is still existing or has been destroyed has hit the target or is a ready off of screen

Same as e0 but for the

yellow missile

Determines the column

L nes 10 25 1000

Contain the routine to set the user defined graphics.

2,0,0

10 FOR n=0 TO 39 20 READ d. POKE USR "A"+n,d 25 NEXT n 29 25 NEXT BORDER 5 PAPER 5: CLS PRINT AT 0,7, INK 1;" "'AT 1,7, PAPER 6; INK MISSILE ATTACK!"'AT 2,7, IN 30 SORDER 5 40 50 PRINT "Defend your Moonbase -HD (and your life) against a missile attack" 52 PRINT PRINT "Use your ray -gun to destroy the missiles" 54 PRINT . PRINT "Shoot down t black missiles with your p-ra 45 (press p to shoot) and gain one Point" PRINT "Use your q-r 56 PRINT iys to shoot at the yellow ones (eress q to shoot) ""A hit adds t your score" #0 to your sty, int "Sometimes you'll face 2 missilesat once.By hitting both you'll gain 6 point to PRINT "Press any ke to continue"

62 IF INKEY\$-"" THEN GO TO 62

64 CLS · PRINT "If a missile h

15 your HO a part of the protection shield will disintegrate"

65 PRINT : PRINT "If you are h

16 the game is over"

68 PRINT PRINT "Choose skill
-level now(press 1,2 or 3)"

70 LET L\$-INKEY\$

71 IF L\$
71 IF L\$
72 THEN GO TO 70

72 LET L-VAL L\$
74 PRINT "Level" 50 PRINT 72 LET L-VAL L\$
74 PRINT "Level ", l, ", "'"You'i
need "; 10+20*i," points to ma
the enemy give up"
76 PRINT PRINT "You have on t need shot for one missite"
PRINT PRINT "Press o to s
the game"
IF INKEY\$<>"O" THEN GO TO 8 one shot 28 PRINT tart 80 101 BORDER 1: PAPER 5. LET (-0 LET h 12-1. PRINT
",1. DRAW INK 5,5/
20,6;"CD". PRINT A
PRINT AT h,29, INK
PRINT AT h,29, INK CLS 102 LET 2.0 LET h-12-(. PRINT 0,0,"Level ", (. DRAW INK 5, 16 PRINT AT 20,6;"CD". PRINT 21,5." PRINT AT h,29, IN 2." PRINT AT h+1,29, INK 1,"A" PRINT INK 1,"A" PRINT INK 1,"A" PRINT INK 1,"B". PRINT INK 2," PRINT 102 LET 2 .0 16 PRINT INK 9, INK 2, 104 IF ATTR (18.8) 4 / 18.5; -150, INK 5, 150, 150 (18.8) -47 THEN DRAW IF INT (RND #5) >3 THEN GO TO 185 300 T s=1 LET x-INT (RND+z/ LET y-8+INT (RND+8). LET LET s=1 (RND #Z / (105 7-11) -6 * INT (RND+0.25) X, INK f; "E"
INKEY#="P" T 107 PRINT AT 9,x, 130 IF 5=1 AND IN THEN 150,150 BEEP 0.01,40 5, 150, 150 LET s-0 IF s-1 AND INKEY\$="q" DRAW LET 5-0 INKEY\$="q" THEN 140 150,150 BEEP 0.01,30 RAU 7, 150, 150 LET 5-0 LET e-ATTR (9,x) IF (=0 AND e-45 THEN GO TO HMI 144 145 400 IF F 6 AND e-47 THEN GO TO 147 30 150 PRINT AT 9,x," ". LET x=x+1 160 IF x>28 THEN GO TO 300 170 GO TO 107 200 BORDER 6 PRINT AT 10,17; I NUERSE 1, FLASH 1, INK 2,"HIT!";

205 BEEP 1 -20 LET Z-Z+1+1/6 206 IF Z> 10+20*1 THEN BORDER 4
PRINT AT 10,7, FLASH 1, "ENEMY
SIVES UP" PRINT AT 20,12, "Final
Score", Z FOR 5-0 TO 10 BEEP PRINT AT 10,13;"
PRINT AT 10,13;"
210 PRINT AT 9,X;"
250 GO TO 104
300 LET a ATTR (9.X)
NK 0,"" 300 LET aLATTR (9,x)
308 IF a=41 THEN PRINT AT 9,x,
INK 0," GO TO 900
310 IF a<>40 AND a<>45 THEN PRI
NT AT 9,x, INK 6," BEEP 0.5,5 PRINT AT 9,x, INK 5," GO T
3 104 104 320 PRINT AT 9,x, INK f, "E" LET x = x + 1330 PRINT AT 4 X -1;" " 340 IF X 32 THEN GO TO 104 340 IF X 32 TI 350 GO TO 300 500 LET [-0 LET e0-1 LET e2=1 LET s-2. LET x=INT (RND #5) LE x2-INT (RND #5). LET y 8+INT (R 40 +8) · LET 42-8+INT 505 IF X=X2 AND 9 = (RND #8) X=X2 AND Y=Y2 THEN CO TO 500 510 IF 6000 THEN PRINT AT Y,x, 520 IF e2<>0 THEN PRINT AT y2,x "E" 530 IF 530 AND INKEY ="P" THEN DRAU 150,150 BEEP 0.01,40 INK 5, -150, -150 LET 5.5-1 540 IF ATTR (9,x)-45 THEN LET 540 a = 0IF ATTR (92,x2) -45 THEN LET 550 e2=0 PRINT AT 9,x," " PRINT AT 555 \$2,X2," " LET X2-X2+1 570 IF 20-0 AND 22-0 THEN LET 2 GO TO 200 X > 28 OR X2 > 28 THEN GO TO 700 580 GO TO 510 700 IF (80-1 AND ATTR (9, x) =41. OR CE OR (82 1 AND ATTR (92, x2) -41) ? EN GO TO 900 720 IF 60-1 AND ATTR (9, x) (>40 (65 HEN 720 IF e0-1 AND ATTR (y,x)(>40 AND ATTR (y,x)(>45 THEN PRINT AT y,x, INK 6," BEEP 0.5,-5 PR INT AT y,x," LET e0-0 740 IF e2-1 AND ATTR (y2.x2)(>45 THEN PRINT AT y2,x2, INK 6," BEEP 0.5,-5 PRINT AT y2,x2, INK 6," BEEP 0.5,-5 PRINT AT y2,x2," LET e2-0 743 IF e0(>0 THEN PRINT AT y,x THEN PRINT AT 2"
746 IF 02()0 THEN PRINT AT 92,,
"E" 748 LET X = X + 1 LET x2 x2+1 "IF eØ<>Ø THEN PRINT AT y,x-780 790 IF 62450 THEN PRINT AT 92,8 2-1 800 IF x 32 THEN LET e0-0 IF x2 32 THEN LET e2-0 IF e0-0 AND e2-0 THEN GO TO 3**10** 820 194 830 GO TO 700 900 BEEP 1,-40. PAPER 6 CLS
PAUSE 50 PAPER 2 CLS PRINT A
T 10,10, FLASH 1,"YOU ARE DEAD"
PRINT AT 21,20. SCORE ", z FOR
5-0 TO -40 STEP -2 BEEP 0.2, b PAPER 6 CLS 5-0 TO -40 NEXT 6 5TO STOP 1000 DATA 0,6,6,2,14,150,230,254 230,230,230,230,230,230,236, 0,1,3,7,14,28,56,255,224,192,12 3,0,0,0,0,0,192,254,255,254,19

the

the

M I

le

а

le

OW

ect.

er.

חחנ

S Or

eras

le's

le s

stil

ır

n

he off

ht

RICHARD SHEPHERD SOFTWARE

A HOME BUDGETING & BANKING SYSTEM THAT REALLY MAKES YOUR



A professional style multi function Cash Controller program that can load and make an entry in just 90 SECONDS ... thanks to its ZX MICRODRIVE COMPATIBILITY. If you're not ready to upgrade to Microdrive yet, this easy to use cassette program can handle up to 400 transactions with your Spectrum, almost filling the 48K memory of your computer.

48K SPECTRUM WORK!

BANK ACCOUNT

- Statements on demand from any date to date
- Holds up to 400 transactions.
- Standing order facility
- All transactions can be automatically coded to allocate up to 16 budget headings.
- Search facility for any single item by description or amount

HOME BUDGETING

- T6 budget headings, e.g. Gas, Rates, Car, Tax you can choose the headings
- Highlights under/over spending
- Full budget expenditure breakdown
- Budget re-think facility

LOAN/MORTGAGE CALCULATOR

All you ever wanted to know but didn't like to ask! Calculates

- Interest rates
- Payback periods
- Capital sum
- Period of loan

REMEMBER THIS CASSETTE CAN ALSO BE USED WITH ZX MICRODRIVE

- PRINTOUT FACILITY
 USING ZX PRINTER
- FULL SECURITY WITH PERSONAL PASSWORD
- FULL SAVE PROGRAM
 ONTO CASSETTE OR
 MICRODRIVE

Available from good computer stores or direct by mail order at a price that won't upset the Bank Manager!





MICRODRIVE

Dealer enquiries weicome. Generous discounts.

	PRIORITY MAIL ORDE
ł	Please send me CASH CONTROLL at £9 95 each including post & packing (oversea orders add £1 50);
i	Name Address
	, March

enclose cash/cheque/P/O payable to Richard Shepherd Software

Or credit my Access/VISA Card Number

Signaturi

MICROPRIVE CARTRIDGE NOT INCLUDED

Credit Card Hotline (06286) 63531

RICHARD SHEPHERD SOFTWARE

OUSE, 23-25 ELMSHOTT LANE, CIPPENHAM, SLOUGH, BERKS. TEL. 1042

MACHINE SPECIFICATIONS

ZX80

Dimensions W oth 174mm (6.85 in) Depth 218mm (8 58 in) Height 38 mm (1 5 in) Weight 300g (10 5oz)

Microprocessor Memory 280A 3 25 MHz c ock ROM 4K bytes containing BASIC RAM 1K bytes internal externally expandable to 16K bytes

Requires an ordinary domestic black and white colour TV. The lead supplied connects between the ZX80 and your TV's aerial socket. The display organisation is 24 lines of 32 characters per the showing black characters on a white screen. The ZX80 does not connect to a printer

Programming

Programs can be entered on the keyboard or loaded from cassette. The ZX80 has automatic "wrap round" so lines of program can be any length but not multi-statement lines.

The syntax of the entered line is checked character by char acter. A syntax error cursor marks the first place the syntax breaks down if there is an error. Once any errors have been edited out the syntax error cursor disappears. Only syntax error free lines of code are accepted by the ZX80

Graphics

Total of 22 graphics symbols giving 48 x 64 pixels resolution consisting of 10 symbols plus space and inverses. Includes symbols for drawing bar charts. Under control of your BASIC program any character can be printed in reverse field

The line edit allows you to edit any line of program or input including statement numbers. The edit and cursor control keys are EDIT, RUBOUT, HOME

Arithmetic operators +, ,x, + exponentiate Relational operators < , > = , yielding 0 or 1 Logical operators AND OR NOT yielding boolean result. Relational operators also apply to strings ZX80 BASIC uses 16 bit two's complement anthmet c (± 32767)

Variables

Numeric variable names may be any length, must begin with a etter and consist of alphanumerics. Every character in the name is compared thus an infinity of unique names is available

String variables may be assigned to or from, shortened but not concatenated String variable names are A\$ - Z\$ Strings do not require a dimension statement and can be any length.

Arrays have a maximum dimension of 255 (256 elements) each, Array names consist of a single letter A-Z

Control variable names in FOR. NEXT loops consist of a single letter A-Z.

Expression evaluator

The full expression evaluator is called whenever a constant or variable is encountered during program execution. This allows you to use expressions in place of constants especially useful in NEXT etc. GOTOs, GOSUBs, FOR

The ZX80 will function in the "calculator mode" by immed lately executing a statement if it is not preceded with a line number

Cassette interface

Works with most domestic cassette recorders. The transfer rate is 250 baud using a unique tape-recording format. Other systems are not compatible with the ZX80's. The ZX80 also SAVEs the variables as well as the program on cassette. Therefore you can save the data for updating next time the program is executed. The ZX80 does not support separate data files. The lead supplied with the ZX80 is fitted with 3 5mm jack plugs.

Expansion bus

At the rear has 8 data, 16 address, 13 control lines from the processor and Ov, 5v, 9-11v, 0 and internal memory control line. These signals enable you to interface the ZX80 to your own electronics, PIO, CTC, SIO if you want I/O ports etc.

The ZX80 requires approximately 400mA from 7-11v DC It has its own internal 5v regulator

TV standard

The ZX80 is designed to work with UHF TVs (channel 36)and is the version required for use in the United Kingdom The ZX80 USA is designed to work with a VHF TV(American channel 2 European channel 3) and is the version required for the American TV system, also for countries without UHF

Width 167mm (6.32 n) Depth 175mm (6.80 in) Height 40 mm (1 57 in) Weight 350 gms (12 15 oz)

Microprocessor/Memory 280A 3 25 MHz clock ROM Containing 8K BASIC interpreter RAM 1K bytes internal, externally expandable to 16K bytes

40 key touch sensitive membrane. Using function mode and single press key word system this gives the equivalent of 91 keys and also graphics mode allows an additional 20 graphical and 54 inverse video characters to be entered directly

Display

Requires an ordinary domestic black and white or colour TV The aerial lead supplied connects the ZX81 to the TV aeria socket. The display is organised as 24 lines of 32 characters with black characters on a white background

Two mode speeds

The ZX81 can operate in two software selectable modes FAST and NORMAL FAST is idea, for really high speed computing In NORMAL mode however the ZX81 allows continuously moving, flicker free animated displays

The 8K ROM will permit instructions (LPRINT LLIST and COPY) to drive the Sinclair ZX Printer

Programming

Programs can be entered via the keyboard or loaded from cassette. Programs and data can be saved onto cassette so that they

SPECIFICATIONS

are not lost when the ZX81 is turned off Syntax check

The syntax of a line of program is checked on entry. A syntax error cursor marks the first place the syntax breaks down if there is an error. The syntax error cursor disappears when errors have been corrected. Only lines free from syntax errors will be entered into the program.

Graphics

Apart from the 20 graphics characters, space and its inverse, the display may also be divided into 64 x 44 pixels leach of which may be 'blacked' in or 'whited' out under program control Editing

A ne editor allows you to edit any line of program or input, including program line numbers unless may be deleted, in creased or decreased in size.

Ar thmetic

Arithmetic operators + x, exponentiate Relational operators , x = , may compare string and arithmetic variables to yield 0 (False) or 1 (True, Logical operators AND OR, NOT yield boolean results

Floating-point numbers

Numbers are stored in 5 bytes in floating-point binary form giving a range of + 3 x 10 ***to + 7 x 10 ***accurate to 9 . decimal digits

Scient fic functions

Natura ogs antilogs SIN, COS TAN and their inverses, SQR,

Variables

Nu nerical

String As to 2s

FOR NEXT loops

A Z (loops may be nested to any depth

Nun erical arrays String arrays

A⊢Z A≰ to Z≰ Arrays

Arrays may be multi-dimensional with subscripts starting at 1

Expression evaluator

The full expression evaluator is called whenever an expression constant or variable is encountered during program execution. This powerful feature allows use of expressions in place of constants and is especially useful in GOTO, GOSUB etc.

The ZX81 will execute statements immediately, enabling tito perform keldicalculator

Cassette interface

Works using domestic cassette recorders. The transfer rate is 250 baud and uses a unique recording format not compatible with other systems. The ZX81 will save the data as well as the program to avoid the need to relenter the data when the program is next loaded.

ZX81 w search through a tape for the required program. The cassette leads supplied have 3.5 mm jack plugs.

Expansion port

At the rear, this has the full data, address and control buses from the Z80A CPU as well as OV +5V, +9V, \emptyset and the memory select lines. These signals enable you to interface the ZX81 to the Sinciair 16K RAM pack and ZX printer.

Power supply

The ZX81 requires approximately 420mA at 7: 11V DC. It has its own internal 5V regulator. The ready assembled ZX81 comes complete with a power supply. The ZX81 kit does not include a power supply.

TV standard

The ZX81 is designed to work with UHF TVs (channel 36, 625 lines

ZX SPECTRUM

Dimensions

Width 233 mm Depth 144 mm Height 30 mm

CPU/Memory

90A microprocessor running at 3.5 MHz 16K byte ROM conng BAS,C interpreter and operating system on byte RAM (plus optional 32K-byte RAM on internal expanon board) or 48K-byte RAM

Keyboard

40 key keyboard with upper and lower case with capitals lock feature. All BASIC words obtained by single keys, plus 16 graphics characters, 22 colour contro codes and 21 user-definable graphics characters. All keys have auto repeat.

Display

Memory mapped display of 256 pixels x 192 pixels, plus one attributes byte per character square, defining one of eight foreground colours, one of eight background colours, normal or extra brightness and flashing or steady. Screen border colour also settable to one of eight colours. Will drive a PAL UHF colour TV set, or black and white set (which will give a scale of grey), on channel 36.

Sound

Internal loudspeaker can be operated over more than 10 octaves (actually 130 semitones) via basic BEEP command. Jack sockets at the rear of computer allow connections to external amplifier speaker.

Graphics

Point, kne, circle and arc drawing commands in high-resolution graphics.

16 pre-defined graphics characters plus 21 user-definable.

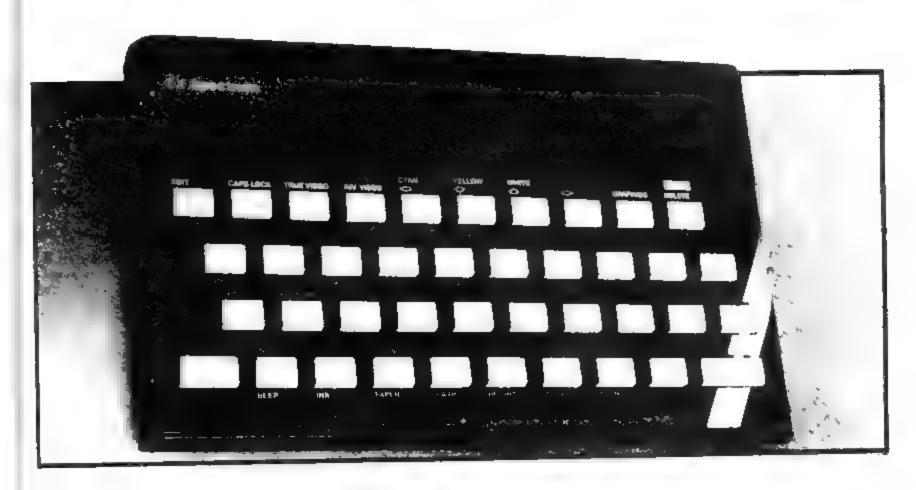
graphics characters. Also functions to yield character at a given position, attribute at a given position (colours, brightness and flash) and whether a given pixel is set. Text may be written on the screen on 24 lines of 32 characters. Text and graphics may be freely mixed.

Colours

Foreground and background colours, brightness and frashing are set by BASIC INK, PAPER, BRIGHT and FLASH commands. OVER may also be set, which performs an exclusive or operation to overwrite any printing or plotting that is already on the screen IN VERSE will give inverse video printing. These six commands may be set globally to cover a lifurther PRINT, PLOT, DRAW or CIRCLE commands, or locally within these commands to cover only the results of that command. They may also be set locally to cover text printed by an INPUT statement. Colour control codes, which may be accessed from the keyboard, may be inserted into text or program isting, and when displayed will override the globally set coours until another control code is encountered. Brightness and flashing codes may be inserted into program or text, similarly Colour control codes in a program listing have no effect on its ex ecution. Border colour is set by a BORDER command. The eight colours available are black, blue, red, magneta, green, cyan yellow and white. All eight colours may be present on the screen at once, with some areas flashing and others steady, and any area may be highlighted extra bright

Screen

The screen is divided into two sections. The top section — normally the first 22 lines — displays the program listing or the results of program or command execution. The bottom section — normally the last 2 lines — shows the command or program line currently being edited. It also shows the report messages. Full editing facilities of cursor left, cursor right, insert and delete (with auto-repeat facility) are available over this line. The bottom section will expend to accept a current line of up to 22 lines.



Mathematical Operations And Functions

x, +, and raise to a power Arithmetic operations of + Mathematical functions of sine, cosine tangent and their inverses natural logs and exponent alsi sign function, absolute value function, and integer function, square root function, random number generation and pr

Numbers are stored as five bytes of floating point binary - giving a range of $\pm 3 \times 10^{-39}$ to $\pm 7 \times 10^{38}$ accurate to 9.6 decimal digits Binary numbers may be entered directly with the BIN function = < = and < > may be used to compare string or arithmetic values or variables to yield 0 (faise) or 1 (true, Logica, operators AND, OR and NOT yield boo ean results but will accept 0 (faise) and any number true)

User definable functions are defined using DEF FN, and called us ing FN. They may take up to 26 numeric and 26 string arguments, and may yield string or numeric results

There is a full DATA mechanism, using the commands READ, DATA and RESTORE

A real-time clock is obtainable

String Operations And Functions

Strings can be concatenated with + String variables or values may be compared with =, >, <, > ||, < =, < > to give boolean results. String functions are VAL, VAL\$, STR\$ and LFN_CHR\$ and CODE convert numbers to characters and vice versa, using the ASCII code. A string slicing mechanism exists, using the form a \$ (x TO vi

Variable Names

Numeric any string starting with a letter (upper and lower case are not distinguished between, and spaces are ignored)

String - A\$ to Z\$ FOR-NEXT loops A-Z Numeric arrays

String arrays A\$ to Z\$

Simple variables and arrays with the same name are allowed and distinguished between

Arrava

Arrays may be multi-dimensional, with subscripts starting at 1 String arrays, technically character arrays, may have their last subscript omitted, yielding a string

Expression Evaluator

A full expression evaluator is called during program execution whenever an expression constant or variable sencountered. This allows the use of expressions as arguments to GOTO, GOSUB

It also operates on commands allowing the ZX Spectrum to operate as a calculator

Cassette Interface

A tone leader is recorded before the information to overcome the automatic recording level fluctuations of some tape recorders, and a Schmitt trigger is used to remove noise on playback

All saved information is started with a header containing information as to its type, title, length and address information. Program, screens, blocks of memory string and character arrays may ail be saved separately

Programs, blocks of memory and arrays may be verified after say.

Programs and arrays may be marged from tape to combine them with the existing contents of memory. Where two line numbers or variables names coincide the old one is overwritten

Programs may be saved with a line number, where execution will start immediately on loading

The cassette interface runs at 1500 baud, through two 3.5 mm jack plugs

Expansion Port

This has the full data, address and control busses from the Z80A. and is used to interface to the ZX Printer, the RS232 and NET inter faces and the ZX Microdrives. IN and OUT commands give the I/O port equivalents of PEEK and POKE

ZX81 Compatibility

ZXB1 BASIC is essentially a subset of ZX Spectrum BASIC. The differences are as follows

FAST and SLOW the ZX Spectrum operates at the speed of the ZX81 in FAST mode with the steady display of SLOW mode, and does not include these commands

SCROLL the ZX Spectrum scrolls automatically, asking the operator 'scrol ?' every time a screen is filled UNPLOT the ZX Spectrum can unplot a pixel using PLOT OVER

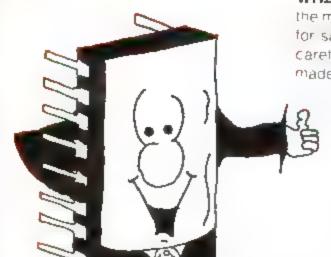
and thus ach eves unplot

Character set the ZX Spectrum uses the ASCII character set as

opposed to the ZX81 non-standard set

Mr. Chip SOFTWARE

SPECTRUM DARTS (48K) Five games of darts for 1.5 prayers 50. Cricket Kiler Round the Board Noughts & Crosses Four evels on play pergame. Take on the computer or friends at these games of skill and Judgemen. £5.50.



WHEELER DEALER A game or two Litwenty players. Become a tycoon of the motor trade. You must obtain gearboxes, tyres and engines, o produce cars for sale. Form, synucales, they and exchange parts, buy dealerships, but be carefully ou may become bankrupt and have to iguidate. Find out what you are made of Have you get what it takes to become a WHEELER LEALER \$5.50.

Sand Cheques PO's o

Dept ZX, 1 NEVILLE PLACE, LLANDUDNO, GWYNEDD LL30 3BL. Tel: 0492 49747

Wanted: High qually software of a Types for export & Like distribution

Ai programs now avaiable on this Please arow £2.50 call hexita

DEALER ENQUIRIES WELCOME

NEW ADVENTURE

for your 16K ZX 81

FULL 16K MEMORY USED

DIMENSION ESCAPE

You are the captain of a starship tighter. You have been blasterf by at ension to meland space into the enth dimension. Your mission is to get your crew, and your on board computer safely back to Earth.

But first, you must return to the third dimension

ONLY £4.99

DEALER ENQUIRIES WELCOME

NAME

ADDRESS

Land ask Cheque PO for £

COULSOFT

40 Bollington Road, Heaton Chapel, Stockport.

LEARN TO PLAY BRIDGE ON YOUR HOME COMPUTER

Enjoy learning to play bridge with Bridgemaster, a complete bridge tutor professionally prepared with world expert Terence Reese

Listen to the commentary as you are coached step by step through the game. While you listen you will learn and play bridge. Bridgemaster contains commentary and computer tapes and a useful reference book — everything you need to learn bridge.

Budgemas er eaty due bring the lame aive to, the begin, ier **Soft**

A encyprofessional program 1 July saue for money. Home Computing Weekly

For the Sinclair ZX Spectrum 16/48K, Commodore 64, BBC B and Electron £24.95

Sinclair ZX81 1K/16K - £19.95

BRIDGE MASTER

Available from Boots, WH Smith and computer stores or direct from Bridgemaster, Freepost, Dept ZX12, PO Box 163, SLOUGH SL2 3YY.

Prices include vAT post and packing Remittances payable to Bridgemaster

ZX COMPUTING

Lineage: 35p per word





Semi display: £8.00 per single column centimetre Ring for information on series bookings/discounts

All advertisements in this section must be prepaid Advertisements are accepted subject to the terms and conditions or nied on the advert sement rate card, available on request).



01-437 1002

Send your requirements to: MARK BECAREVIC ASP LTD, 145 Charing Cross Road,

SOFTWARE APPLICATIONS

AUTO-DATA

Auto-Data is an extreme y c. mprehr sive vehicle is alt in the neighbors. 48K Spritti cove's engine ransmission man a and auto matic braking system is ispension streeting and electrics a dialso has an optional Jobs actifying the Zx printer Auto-Data is simple nuse and is the univ program of its kind to lary of the popular micro compilters Auto-Data will save £ is an your garage bit si Auto-Data should be available irom most good so tware outlets built in difficulty send cheque or passa older o £5.50 al inclusive to ERC Computer Services (Dundee), 53 Thurso Crescent, Menzieshill, Dundee DD2 4AS. Dis ribulors and dealers, write now foll be alis of a hazing disculation

KEEP THE BANK MANAGER AT BAY WITH . . . HOMAC ZX Home Accounting System

Homaciis helidea way tokeep rackin a lybur nolime spendi ing and sayings handles accounts to cash hank treu cards building socielles erc You der rie how much dria you need and Homac will privi duce precisely taldied stale. ments and sun traties. Also use Homa: for your budgets and opredict your rised card bils Holds up L 1000 eco ds and severa cur oncies, ZX 81 000 and single curency Both velsions ale hachine code assised honor milyer sions instructions are within he program and a elaccessible at any me

HOMAC . . £8.95

Please state 4 ZX81 16K or Spectrum 48K) version is required Price includes cass ettes and instrictions. Post and раск пр £1,05

> David Martin Associates Ltd 71A Princes Road, Richmond, Surrey TW10 6DQ

Telephone 01-948 1053

ASP CLASSIFIED 01 - 437 1002

SPECTRUM KOPYKAT IMPROVED PERFORMANCE

Simply the best Copyric any pro-gram is now an easy as CABing an SAVEing you own programs. Any ZX Spectrum program can be backed up onto a fresh tape Even programs that cannot be stopped can now be copied 100 per cent machine code Prints file names Copies header ess I es SPECTRUM KOPYKAT uses no program area so full size pro-grams over 41.7% 9% 4 68 grams over at 7k 9k in ek machines under ibi Pu S FREE Histo Reado

program Despatched by lirst class return of post, let 1 cheque PO £4.95 to

MEDSOFT 61 Ardeen Road, Doncaster South Yorks DN2 SER, TOAN EVEN OPY TREES

MUSIC GAMES SPECTRUM 16K 48K

FIREWORK MUSIC Flucations pame is little team and in names if inchin base clets. And it collous may are supposed in and y wair in call make. Ages 8

TUNER Devening a shall isida ear while ying illav Super Tuning practice or glitalists etc. and 2 prayer versions light let for us \$5.

SOFTWARE COTTAGE 19 Westfield Drive, Loughborough, Leics, LE11 3QJ wood Side from Science of Mile ara cognit

SPECTRUM Trade Secres no udes making proglams nlistable unstoppable invisible How to level such programs alos hars ps 13 Genuma Kopia ape copier £3.95 z X Qualanteed office ZC 29 Chadderlon Drive Insworth Buly Lancs

TAPE COPIER

4 5 BIN HA W SI WY AA. K. J. AHAN.

HILL'S MAR 1 'K

N. N. O. J. BRAGRIG' SCHME. 4. ÷ Tay P ya pa ya Heade ws. H. cas DO% 101 No 24.50 Door 40

LERM

Dept Z, 16 Stonep t Drive, Market Harborough, Lelcs.

Educational Software? SAE for dotar s

'ALLOTMENT' (ZX81 16K)

The etiment and asceraling way v piai your echable gardien An mared on salide dialenting dations into an ending and танналь Тря

van he wirne day in plan next YEL She HERRY assette in lides rilim, ahensive

programme derails, inimiting easy at Planch and expension of have to he use sincisonal equirements

£4 75 chaque/P O 1o: J. M. SENIOR 8 The Ekma. Shaw, Swindon SN5 9PL

40x24 SCREEN for ZX Spectrum No Prikes L. Gos bs. us. 1909 normal print state terms. Makes display only near £199 / eques Plant Pik Blown 18 Bendor Clase Binsdon Swinter Air shie SNZ 4Bt

48K SPECTRUM Tile programs videos with your layor Earth et erin foly additional sizes a colours Chawlea e Cassette £450 S E Erns 86 Apon Auad Kingha Harrogate.

PLAY THE GUITAR. Bly hm synthesise and how to lead musir 48k Spectrum programs 15-0 each Scott Massie No 1 Bungalow Francis Burghfield Common Berks

MONEYMINDER BANK ACCOUNT PROGRAM 46K SPECTRUM PRINTER FOR ONLY £5.50

Ham Dy Orac at sactions
 Auto 1 year Standing Oriens
 Back Submers + The Tables

•Exporters richage and all many all amounts Data in the regard all April

RUSSELL SOFTWARE Lancaster Lodge. Hampton Co. Rd., E. Molesey Surry KT8 9DA 01 943 2501

SPECTRUM

POOLS PREDICTOR

An easy it use very powerful Football Phois Prediction going amiling the 48K Spectrum combining fild ferent fore-casting techniques based on a comple-hensive analysis of correct form 14.99

MAYDAY SOFTWARE 181 Portland Crescent. Stanmore, Middlesex HA7 1LR

POOLS PREDICTION SPECTRUM) (ZX81 16K POOLSWINNER! The ultimate pools

prediction program 5 All Mail 5 (0)

alt in a policin and originality of soul property of soul

POOLSDATA

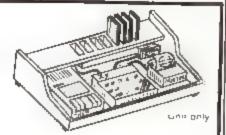
of prophess of the service of the servic

Immediate dispatch from: SELEC SOFTWARE n, dip game neader in state n 4 age

ASP CLASSIFIED 01 - 437 1002

ACCESSORIES

TO ALL SINCLAIR SPECTRUM AND ZX 81 USERS



Pullaway a lust in idvivires with his amazing new incidesigned by a Spent model Pulth such an achair ahelinin na your iap M vir. a indine go Made o bus quality try-your and polished in gh in dark maliugany or thank Please stationous a £23.50 nounding vAT and P&P Please sond Cheques PO sin

E. R. CAMERON & SON LTD H/O 9 THE VINERIES, ENFIELD, MIDDX EN1 3DD

WE HAVE BEEN MAKIN 3 THINGS IN WOLD SINCE 1870

SPECTRUM 16/48K

TAPE BREAKER

description of the alling and the alline at the width of the alline and the three appropriate and the alline at th

SPECTRASOFT Dept A Capital House Market Place, London W3 6AL

SPECTRUM 2X81

VERHEA NO NO SY KE & AHDA NA (T) TO W FR Fr Eng P a hayrin de H DO 157 yr ng stands hare Pras sa made - £8.95 eques and Firs a 18 s n

PR ELECTRONICS 14 Bretby Close, Doncaster DN4 6FL

ZX81 - FORTH ROM

with multi-tasking

Runs more than 10 tasks at once. Schedule tasks to riin from 50 times per second to once a year ildea. for control purposes. Three times taster than fig. FORTH by 1g comparbe Avaiable as a fit it yourself EPROM with an extensive manual for £25 plus vAT. Some ready converted ZX81's available

Coming Soon!

FORTH I O cartridge for Spectrum £59 plus vAT Ask for details

> David Husband 2 Gorleston Road, Branksome. Poole BH12 1NW Telephone: 0202 764724

SPECTRUM TAPE ACCESSORIES

MIGN-SPEED LOADER! that and save at 2000 bood on a normal rischildre with our short Spendyhood programs. Cast to use with any conformal Castama 4845; CS 85.
ANT DIMATE, "ARPS CONTROL allogs in Spectrum, tassethe specials for earth 99 477 and DAUS-SAVE partitioning of one or three recorders! Operated by BASH, program or lamptoner communities that in 69 477 and DAUS-SAVE partitioning of one or three recorders! Operated by BASH, program for lamptoner communities that in 69 477 and plant with volume control of this seem status switch for inventor, and the seem status switch for inventor, and the seem status switch for inventor, and the seem status switch for inventor, and the seem status switch for inventor, and the seem status switch for inventor, and the seem status switch for inventor and the seem status switch for inventor and the seem status switch for inventor and the seem status.

ZXB1 VIDEO INVERTER Saves your eyes increases safe level displays sharp while characle sign solid black background. Screen kill 14 builth includes vAT and F&P structions. Send cheque posta o delta O Frisch 6 Standan Road the wa Warrington Cleahire

NESS MICRO SYSTEMS

ADD-ONS

WA4 JHS

UPGRADE YOUR 16K ZX SPECTRUM TO 48K

SIMPLY FITS INTERNALLY WITH NO SOLDERING ON SERIES 2 MODELS. UNLIKE COMPETITORS, WE USE NO REJECT COMPONENTS AND AN ADAPTOR P.C. BOARD TO ACHIEVE RESULTS. DESIGNED BY EX SINCLAIR ENGINEER. MODEL CP48 £23,95 inc. P&P (EXPORT AND UK). EX STOCK.

32K MEMORY EXTENSION ONLY £23-\$5

Citadel Products Ltd TEL:01-951 1848 DEPT ZX, 50 HIGH STREET, EDGWARE, MIDDLESEX HAS 7EP.

SOFTWARE EDUCATIONAL



the Educational Consultants

Brothlyk Marrical in ZXB 6K and Sport Mny ry diagrams and work in xport ien's it ithing sy hes - 10 at is a didicusion. Fix Bo Kalling gluings miderule

A Si upt mentily asset of Abuve not sside described with supplemental for side of all measures payments.

£6.90 lite pair Save £1 Available in APA, 2 Dodds Crescent West Bylicet, Surrey KT14 68T

HOMESTUDY

TRELEIGH WOODS FARM REDRUTH CORNWALL

48K SPECTRUM

PHYSICS 'O LEVEL REVISION A.E.B Syllabus 052 £22 8 Teaching + 8 + aue + 14 Paper 2 + 8 Paper 3 Programs 2 x C60

Available in Lener her

MATHEMATICS O' LEVEL REVISION

LONDON Symbos B 361 1984 5 AMBRIGE Syllabus D 4004 1984 5

£26

WE GUARANTEE YOUR EXAMINATION SUCCESS

Or we will relind he full jurchase price.

Prices will be no eased by about him inches 1st January 984.

TEACH YOUR CHILD SPECTRUM (15 or 48K)



TELLING THE TIME E7 00 LEARNING TO READ £6.50 HIDDEN LETTERS £6.50

MONEY

All prices include P&P and knyboard OVE Tay Poppy Programs, Rochmond House, holelan, Camforth LAS 3AN.

PRE-SCHOOL Early School Turor 7 exciting and educational games a for £5.00 A, hmetic numbers spelling drawing music keyboard snap Sulable 6 48k Specifym Faniasic value of nic ey Essex Software 6 Huns hans Drive uphinster Essex

4 ZX81 GAMES FOR THE PRICE OF 1

Multigames has 4 games on 1 cassette for £3.50

MULTIGAMES
The Old Malthouse,
Brimpsfield, Nr. Gloucester.

SPECTRUM SOFTWARE 48K

Steve Silver adventure games
Adventure 1 £6.40
Adventure 2 £6.40
Moonlander £4.95
Robotic Capers £4.95

16K

Blitz + Code Breaker £4.95
Write or phone for details of our new software. Prices include P&P Computers available at discount prices. Send SAE for details. Send Cheque /PO to:

WB SOFTWARE 192 Seamer Rd, Scarborough, North Yorkshire YO12 4HG Tel: 0723 70074 WHODUNIT. Crime Detection game. Find the killer before you become the next victim. Five difficulty fevels, different solution every time, 46K Spectrum, 25.95. Placet Software, 24 Marl Road, Radcliffe-on-Trent, Nottingham NG12 2GY.

SOFTSPOT We are offering a 10% discount on a range of 17 cassettes

Over 50 ZX Spectrum games programs in our current catalogue. Titles from all major publishers and independent suppliers. ARCADE ACTION. FANTASY & ADVENTURE, STRATEGY AND WARGAMES, MINDGAMES, FAMILY

GAMES etc SPECIAL OFFER. Buy any 5 litles and chose one ABSOLUTELY FREE.

Send 2x16p stamps for our latest catalogue.

2 Rectory Gardens, London SW4 0EF.

FED UP with being chased by Mac Happy Pan Eaters? Try Splat refreshingly original! Incentive Software Ltd., 54 London Street, Reading (0734) 591678.

ZX SPECTRUM SOFTWARE

We are offering a 10% discount on a range of 17 cassettes if either two or more tapes are bought or a minimum order of £10 is made from us.

Tel: 031-334 7261 for details of software, or/send a SAE for listing to:

RULE COMPUTERS 30 Tyler Acre Road Corstosphine, Edinburgh EH12 7HZ

SACITTARIAN *SOFTWARE*

Games for the 16/48K Spectrum

PINBALL

Superb, colourful, test-action graphics a sound gives this game the feel of a real arcade pin-table. With realistic faunch, flippers, bumpers, high-score, bonus scores and PREBALL features. Be a wizard for just £5,95, PLUS Gamespock 1 — Featuring Fruit Machine, Pontoon, Othelio, Mustymind, Calendar, £4,95 Special Other—Both tapes for just £9,95 Prices inc PAP Cheque/PD to Segitherian Sollware £42 (2X) 3 Wythburn Close, Loughborough, £E11 3SZ.

A

ANCO SOFTWARE

50 AMAZING ARCADE GAMES FOR YOUR SINCLAIR SPECTRUM

All the favourites are here: Pacman, Invaders, Frogger, Lunar Lander, Fruit Machine, Defender, Bomber, Pontoon, Breakout, Asteroids, Submarine, Surround, 3D Maze, Escape, Aliens, Golf, Dodgem, Target, Tug'O'War, Pilot, Driver, Simon, Ship to Air, Connect 4, Biorythms, Stuntcycle, Krazy Digger, Gunner, Mastermind, Helicopter, Froghop, Tron, Balloons, Lure, Matchsticks, Ski-Run, Grid, Reactor, Invader 2, Buffer, Fuel Dump, Racer, Blast Off, Play Your Cards Right, Tennis, Ruler, Shoot Em Up, Gunslinger, Treasure Hunt, Arithmetic.

SPECIAL OFFER PRICE ONLY £6.99
All with Hi-Res Graphics.

10 GAMES FOR SPECTRUM...... ONLY £3.00
DEFENDER 48K SPECTRUM £2.50
KONG 48K SPECTRUM £3.50
50 ARCADE GAMES ZX81 £6.99

All prices include post and packing. Computers available at discount prices. Send SAE for details.

We require Arcade quality games for the Spectrum for distribution in Europe, Australasia, United Arab Emirates and UK, and can offer up to 50% royalties for the right games. Send your game at once for immediate attention.

Post your cheque or postal order quickly to avoid disappointment to:

ANCO SOFTWARE

(Dept ZX) 25 Corsewall Street, Coatbridge ML5 1PX.

Hornby Software

The Champions of computerised golf. Highly recommended Pick your own course, pick your own handicap, pick any club. Exact simulation of Britain's top golf courses. All golf rules observed Information on each hole e.g. distances, par. Graphics Excellent, Designed for one or two players. Suitable for the whole family. Extremely realistic.

PLAY LIKE A PRO

TROON (49K) As reviewed by Sinclair User August edition 1982 British Open Championship Course £6.95

Royal Birkdale (48%) Scene of the recent British Open Championships £6.95

Lindrick (48K) One of the North's most exciting courses £6.95

Wentworth (West & East Courses) (48K) follow the Burmah Road, the dream and nightmare of all goffers. World Match Play course. £10

SPECIAL XMAS OFFER
Play the four courses for £25
Pro Golf (16/48K) 9 hole
simulated course £4.95

ALL PRICES INCLUDE P&P

21 Pinfold Hill, Leeds L515 OPW
For North American Sales contact

Toronto Software World

AUTOCRAT for ZX81 16K. The best management game available for your micro. Only £4.95 from A. Sargeant. 85 Winns Avenue, Walthamstow, London E17.



FOR YOUR 15/48K

of moutating infordation — care you keep up?

ES from retailors (sub) or direct (24 he dispetch) Soft Mill, 25 Siglian Radel, Haddenham, Ely, Combridgeshire CBE JKD

SOFTWARE MISCELLANEOUS

SPECTRUM M/C CODERS!

DON'T READ THIS IF ALL YOUR PROGRAMS WORK FIRST TIME

However, the rest of us do make mistakes But now, you can dramatically reduce debugging time. DEMON is a purpose built monitor that harnesses your M/C code program. DEMON constantly displays diagnostic information about your program, and allows you to stop, examine, change and resume processing. Thus you run and debug simultaneously. DEMON resures. • Break key and/or Break points • Stop one instruction at a time, or run continuously • Change registers/storage at any time • Keep selected registers storage on the screen continuously • DEMON is load address independent (i.e. LOAD's almost anywhere) • Compact size of DEMON ideal for 16K Spectrum • Simple to use menu panels (no need to keep flicking through a tenghty manual) • Slow down/Stop/Trace ROM (see exactly how those ROM routines actually work in action) • Hex or Decimal input/display • Deagnostics to any part of screen, or printer • Switch DEMON on/off at will. Jumb back to BASIC • more. All inclusive price of only £5.95 [16K or 48K Spectrum only). Cheques/POs to:

MICROCOSM, 68 The Grade, Clayhall Illord, Essen IG5 ONF

NATIONWIDE SHOPS & DEALERS

Bowils

Bowles are leading specialist suppliers of the Sinclair ZX Spectrum Personal Computers. We consider our service to those who own or are interested in any products in our range cannot be matched by any other supplier Just took at what we have to offer.

Shop Demonstration Facilities

Shop Demonstration Facilities * Halpful Advice * Huge Range (software, hardware, peripherals books etc.) * Educational Specialists * Try Before You Buy * Service/Repairs (chesper than Sinclair!) * Breakdown Insurance * Competitive Prices * Mail Order (24 hour service) * Easy Payment (Visa, Access etc.) * Opening Hours (Sal a 30-5 30; Tues-Fri 10.30-5 30).

Want to know more about the ZX Spectrum and the great Products and Services available at Bowies? Then write or call for our free catalogue. 55 Bradford Street, Walsall, W. Mich. WS1 3ZX, Why not phone your order? Tel: (0543) 371090

MICROS

51 QUEEN STREET, MORECAMBE. TEL: 411435. Also open Sundays.

Sinclair, Commodore, Acorn/BBC + Dragon + Lynk Authorised dealer for Bug-Byte, Imagine, Quicksilva, Artic, Melbourne House, Silversoft etc.

SERVICES

ZX REPAIR SERVICE At last no need to wait for weeks

Send your faulty ZX 81 for fast reliable repair. We will repair any ZX81 KIT or READY BUILT UNIT.

ONLY £15.95 fully guaranteed + £1.75 p&p

Please state the nature of the problem. Send cheque or postal order to:

NEXT COMPUTER SYSTEMS

88 Harvest Road, Englefield Green, Surrey TW20 0QR

WANTED

SPECTRUM SOFTWARE SWAP. Send cassette with instructions. I will return cassette with an equal number of different programs of comparable quality interested in all types of programs. Richard Hasty, Hegel Strasse, 13D, 6520 Worms, West Germany.

NORWAY. Software and hardware agencies required for the Norwegian market by company covering the whole country. Enmas Import, \$280 Dalekvam, Norway.

5D SOFTWARE Program Writers Co-operative Hempland Cottage, N. Lopham Diss. Norfolk

PROGRAMMEAS: Our Author-Members not only receive 70% of income from their published software, also there are many other benefits in joining us. Send was a copy of your latest work and tell us about yourself. (Any Popular Micro). Copyrights fully respected.

respected.

• MICRO-OWNERS We write and distribute good quality, original software at sensible prices, not expensive psychodetic packaging. Why not send for our lists. (Give details of your sension)

BOOKS PUBLICATIONS

LOOKING for a market for your programs? Our new list contains details of 85 suppliers, U.K. & U.S. who want software for ZX81, Spectrum, etc. 85p. ZX80/1 Register, lists suppliers, software, hardware, publications, to clear E2.20 Youngs Computer Publications, 2 Woodland Way, Gosfield, Halstead, Essex

ASP CLASSIFIED 01 - 437 1002

CLASSIFIED ADVERTISEMENT — ORDER FORM

1	2.	3.	
4.	5.	6.	
7.	8.	9	
10	11.	12	-
13.	14.	15	

When placing your a, please state classification required. Min. 15 words. 35p per word. Send to:

ASP CLASSIFIED, 145 Charing Cross Road, London WC2.

.

Please place my advert in ZX Computing for ____ issues. Please indicate number of insertions required.

Address

AD INDEX

	AD INDEX				
Addictive Games	Kuma Computers				
Abersoft	Kelwood Computer Cases				
AGF Hardware	Kemp				
Alan Firminger	Longmans				
3uffer Micro Shop	Moviedrome				
dge Master	Micronet				
Puter Addons	Micromyte				
pusound	Mr Chip Soft				
Il Software	Memotech				
C,C,S	Microgen				
C.R.L	Meow Micros				
-ioae	MDA Modon,				
mbell Systems	Microsphere				
Cascade	Microsphere				
Cheetah Marketing	Odyssey				
Caulsoft	Print & Plotter				
Currah Computer Components	Protek				
D K Tronica	Proteix				
Discount Software	Pinghurst Data				
	Pinshurst Data				
Digital Integration	Phines Assoc				
East London Robotics	Phipps Assocs				
E R Cameron	Rose Soft				
Fox Electronics	R&R Soft				
Fry	RE Comps				
File Sixty	Racing & Football				
Fuller Micro Systems	Richard Shephard				
Grants	Software Supermarket				
Griffin & George	Sinclair Research				
Interface	Saga Soft				
Incentive Software	Sharpe				
John Wiley & Sons	150				
	Silver Soft				
J.G.A	Softeach				
Keysoft	University Soft				
	Voltmacs				

4 - 5

SPARIL

Micro Speech ZX Spectrum talk!!

JUST PLUG IN AND USE

Micro Speech is easy to use simply plug into your Spectrum and TV and enjoy a new dimension; instant voicing of all the keys infinite vocabulary at your command intonation to add character to speech exciting new range of sound and speech games

U IT'S AS EASY AS THIS!

LET S\$= "me(rr))EE) krismus" will say "MERRY CHRISTMAS"

U QUALITY SOUND

Micro Speech talks through your TV's loudspeaker, ensuring top quality sound.

WHAT CAN'T IT DO!

Unlimited vocabulary means that Micro Speech can say anything it can even be made to yodel! There is nothing it cannot say!

μSPEECH

NEW SOUND GAMES USING MICRO SPEECH INCLU

- J Attic Attack : Lunar Jetman (Ultimate)
- U Colour Clash : Shark Attack : 3D Monster Chase (60
- U Fire Birds : Lunar Rescue (Lyversoft)
- Voice Chess (Artic) | Mined Out (Quicksilva)
- Mysterious Adventures Part 1 4 (Digital Fantasia)
- U The Birds and the Bees (Bug Byte)
- Blastermind (Martech Games)

Adding a new dimension with

Available nationwide or direct from Currah

Address.....

CURRAH USPEECH

Send to: MICRO SPEECH OFFER, P.O. BOX 1, GATESHEAD NEB 1AJ, Tel NEWCASTLE (0632) 824683 Please send me MICRO SPEECH units. Name (Print clearly)......

Postcode

i enclose Cheque/Postal Order payable to "Micro Speech Offer" or debit my Barclaycard/Access account No.

understand that I can have my money back within 10 days of purchase III am not delighted. 12 months parts and labour guarantee

Please allow 21 days for delivery

ONLY £29.95 EACH

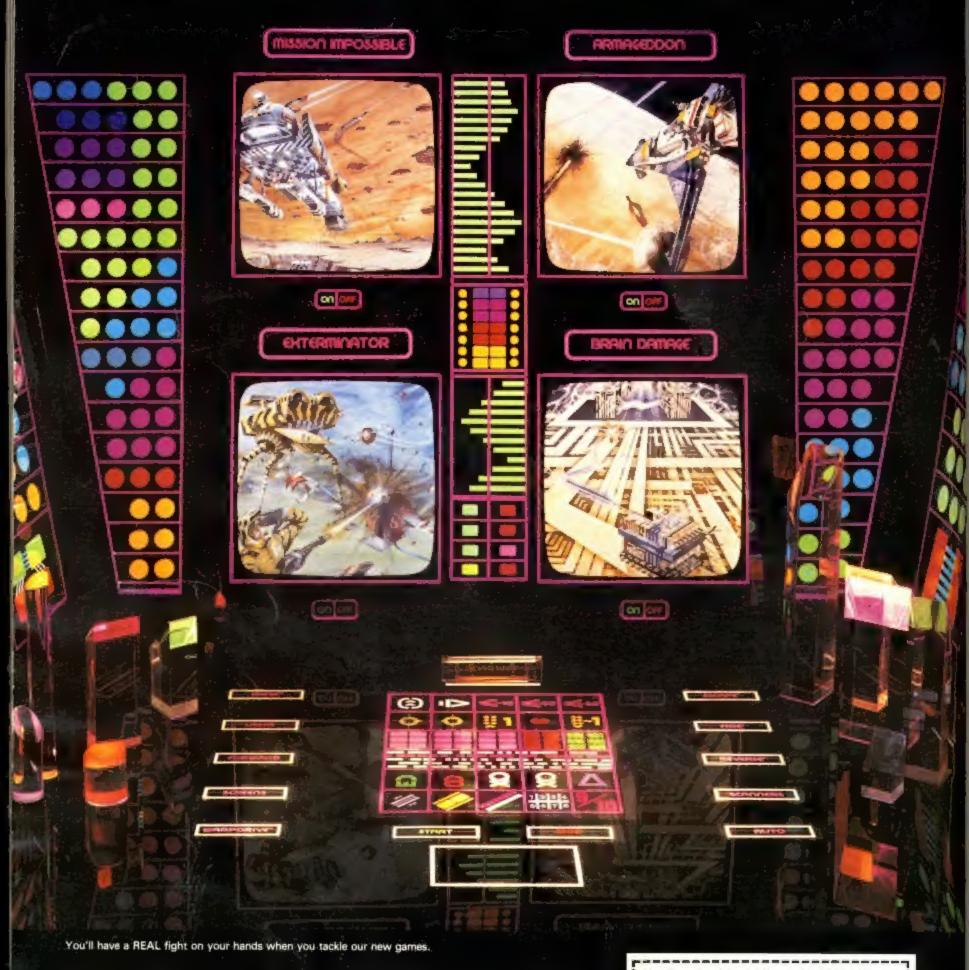
INCLUDING

J FREE SOUND GAME

U COMPREHENSIVE MANUAL

U DEMO CASSETTE

BOOK A TEST FIGHT TODAY!



They're all-action games designed to push your senses to new limits. Take "Brain Damage"; trapped in your computer's micro-circuits you'll need all your resources to defeat the CPU's electron panzers . . . and if they don't get you, the Rogue Programs will.

When you get your breath back you'll be running for your life again in "Exterminator". Transported into the future you'll find that earth is a very different place. Robots rule the world and the human race is almost extinct, there's only one family left. You have to save them ... but hurry you don't have much time.

Sitting in defense command, your hands poised at the controls, you scan the sky for activity knowing that it will shortly erupt. "Armageddon" is about to begin ... only YOU can save the last six cities. If you're still in control of your senses you can try

If you're still in control of your senses you can try your hand at rescuing the miners trapped on Titun ... easy you think! Ride your ship through the minimeteor storm and pick up the men. But you didn't reckon on the corporation spaceships making this "Mission Impossible".

Book your test flight today. Buy any of Silversoft's new games and find out if you're really in control.

Tot Silversoft Ltd. Landon House, 271/273 King St,
Landon WB

Please send ms

I enclose a cheque/postal order for:

Please debit my ACCESS Na

Name

Address

All games run on any ZX-SPECTRUM and cost £5.95, write today for full details of our complete range of software.

Selected titles are available at W.H. SMITHS, BOOTS, JOHN MENZIES, and at all good computer stores.